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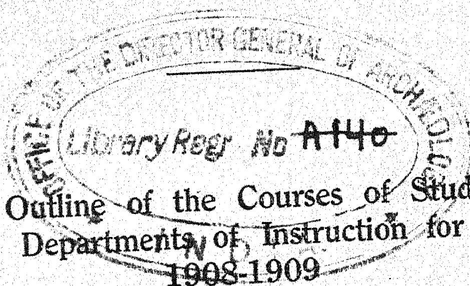
THIRTEENTH REGISTER

OF THE

UNIVERSITY of MONTANA

MISSOULA, MONTANA

1907-1908



With an Outline of the Courses of Study and the Departments of Instruction for
1908-1909



HASELER BROS., PRINTERS, MISSOULA.



ıR FOR 1908-1909

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ıy, September 8.
ıtember 8.
September 9, 8:30 A. M.
Vednesday, November 25, 12:30 P. M.
onday, November 30, 8:30 A. M.
ıy, December 18, 4:00 P. M.

)09

ay, January 5, 8:30 A. M.
ınuary 29.
mester, Tuesday, February 2.
February 3, 8:30 A. M.
19.
Clarkia Society, Friday, March 5,

of Elocution and Physical Culture,

y to State Contest, Friday, April 16,

day, Thursday, Friday and Saturday,

e 4.
ntest, Preparatory Students, Friday,

est, Saturday, June 5, 8:30 P. M.
une 6.
ic, Monday, June 7, 8:30 P. M.

erary Societies, Tuesday, June 8,

9.
June 9, 8:30 P. M.
ne 10, 10:30 A. M.

CALENDAR, 1908-9

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MONTANA STATE BOARD OF EDUCATION

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ALBERT J. GALEN, Attorney General

W. E. HARMON, Supt. Pub. Instruction, Secretary.

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CHARLES R. LEONARD, Butte	"	"	"	1, 1910
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O. P. CHISHOLM, Bozeman	"	"	"	1, 1912
S. D. LARGENT, Great Falls	"	"	"	1, 1912
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T. C. MARSHALL, Secretary	Missoula
HIRAM KNOWLES	Missoula

THE FACULTY

OSCAR J. CRAIG, Ph. D. . . . University Place, University Avenue

President.

A. B. Asbury University, 1881; A. M., De Pauw University, 1884; Ph. D., University of Wooster, 1887; Superintendent of City Schools, Sullivan, Indiana, 1881-1883; Professor of History and Political Economy in Purdue University, 1883-1895; President of University of Montana since 1895; Member of the National Council of Education; Member of the Executive Committee of the National Association of State Universities; President Department of Higher Education National Education Association.

CYNTHIA ELIZABETH REILEY, B. S. . . . 809 East Cedar

Professor of Mathematics.

B. S., Glasgow College, Ky., 1889; Student at Moore's Hill College, Ind., National Normal University, Ohio, and Cornell University; Principal of Schools, Alexandria and Ft. Thomas, Ky.; Teacher in High School, Missoula; Professor of Mathematics, University of Montana since 1895.

W. M. ABER, A. B. . . . . No. 26 Hammond Block

Professor of Latin and Greek.

Graduate from Normal School at Oswego, N. Y., 1872, and from Yale in 1878; Graduate Student at Johns Hopkins, Cornell and University of Chicago; Instructor in Oswego Normal School; Professor of Latin and Greek, University of Utah, 1900-1904; Professor of Latin and Greek in University of Montana since 1895.

FREDERICK C. SCHEUCH, B. M. E., A. C. . 309 S. 5th St. West

Professor of Modern Languages and Secretary of the Faculty.

Attended Public Schools, Barcelona, Spain; Graduate Gymnasium, Frankfurt on the Main, Germany; B. M. E., Purdue University, 1893; A. C., same, 1894; Professor of Modern Languages and Secretary of the Faculty, University of Montana, since 1895.

MORTON JOHN ELROD, Ph. D. . . . . . 205 S. 5th St. East

Professor of Biology.

B. A., Simpson, 1887; M. A., Simpson, 1890; M. S., Simpson, 1898; Ph. D., Illinois Wesleyan University, 1905; Adjunct Professor of Science, Illinois Wesleyan University, 1898-9; Professor of Biology and Physics, Illinois Wesleyan University, 1891-7; Professor of Biology, University of Montana, since 1897; Director University of Montana Biological Station since 1899.

FRANCES CORBIN, B. L. . . . . . . 310 S. 5th St. East

Professor of Literature.

Chicago Woman's College, 1885-1887; New York State Normal School, Graduated, 1888; Student in Vassar College, 1890-1892; B. L., Ohio College, 1902; Student in Harvard Summer School, 1904; Teacher of Literature, Butte High School, and Principal Butte High School, 1893-1900; Professor of Literature, University of Montana, since 1900.

WILLIAM D. HARKINS, A. B., Ph. D. . . . . . 521 E. Pine St.

Professor of Chemistry

A. B., Stanford University, 1900; Ph. D., 1907; Graduate of the Department of Chemistry, Stanford University, 1900; Graduate Student, University of Chicago, 1901 and 1904; Graduate Student, Stanford University, 1905-1906; Assistant in Chemistry, Stanford University, 1898-1900; Instructor in Analytical Chemistry, Stanford University, 1900; Chemist in Charge of Smelter Smoke Investigations for the Mountain Copper Company, 1904; Professor of Chemistry, University of Montana, since 1900.

JESSE PERRY ROWE, Ph. D. . . . . 118 S. 4th St. West

Professor of Physics and Geology.

B. S., University of Nebraska, 1897; M. A., 1903; Ph. D., 1906; Student, University of Oregon, 1893; Graduate Student, University of California, summer 1901; Graduate Student, Chicago University, summer, 1905; Assistant in Geology, University of Nebraska, 1894-7, Fellow and Instructor, 1897-8; Assistant Principal High School, Butte, Montana, 1898-9; Principal Lincoln School, Butte, Montana, 1899-00; Instructor in Physics and Geology since 1901; Director University of Montana Geological Survey since 1902; Assistant United States Geological Survey, 1906.

WILLIAM FREDERICK BOOK, Ph. D. . . . 212 S. 5th St. East

Professor of Psychology and Education.

A. B., Indiana University, 1900; Ph. D., Clark University, 1906; Graduate Student, Chicago University, 1901; Fellow in Psychology, Clark University, 1903-06; Principal High School, Princeton, Indiana, 1900-03; Lecturer in Psychology, Summer School, Indiana University, 1907; Professor of Psychology and Education, University of Montana, since 1906.

JAMES S. SNODDY, A. M. . . . . 415 Roland St.

Professor of English and Rhetoric.

B. L., University of Missouri, 1883; A. M., University of Nebraska, 1898; Graduate Student, University of Chicago, Winter Session, 1893-94, Summer Sessions, 1895, 1896, 1899; Stanford University, 1902-03; Acting Librarian, University of Missouri, 1885-87; Instructor, High School, Westport, Missouri, 1888-91, and Educational Institute, Kansas City, Missouri, 1891-93; Instructor in English, Woodson Institute, Richmond, Missouri, 1894-97; Teaching Fellow in English, University of Nebraska, 1897-98; Instructor in English, State Normal School, Valley City, North Dakota, 1898-1902; University of Montana since 1904.

JOSEPH HARDING UNDERWOOD, M. A., Ph. D. Prescott's Cottage

Professor of History and Economics.

B. A., Western College, 1902; M. A., State University of Iowa, 1904; Ph. D., Columbia University, 1907; Graduate Scholar in Economics, State University of Iowa, 1902-03; Fellow in Economics, State University of Iowa, 1903-04; University Fellow in Sociology, Columbia University, 1904-05; Student, University of Chicago, 1906; Instructor in English and History, Nora Springs (Iowa) Seminary, 1905-06; Professor of History and Political Science, Leander Clark College, 1906-07; Professor of History and Economics, University of Montana, 1907.

LOUIS CLARK PLANT, M. S. . . . . Gerald and University Ave.

Associate Professor of Mathematics.

Ph. B., University of Michigan, 1897; Principal, Olive, Michigan, 1889-91; Overisel, Michigan, 1891-93; Graduate Student, University of Chicago, 1897-8; ibid, Summers 1899, 1900, 1902, 1905, 1906, 1907; M. S. ibid., 1904; Assistant in Mathematics, Bradley Polytechnic Institute, 1898-1900; Associate, ibid., 1900-04; Instructor, ibid., 1904-07; Associate Professor of Mathematics, University of Montana, 1907.

NATHANIEL R. CRAIGHILL, S. B. . . . 218 South 4th St. West

Professor of Engineering—In Charge of the School of Engineering.

Graduate Massachusetts Institute of Technology in Mechanical Engineering, 1893; in Electrical Engineering, 1894; with Victoria Cotton Mills, Newburyport, Massachusetts, January, 1895-June, 1895; with Bell Telephone Company, Philadelphia, June, 1895-September, 1895; Professor of Mechanical Engineering, North Carolina A. and M. College, September, 1895-September, 1897; Designer, Department of Sewers, Boston, Massachusetts, September, 1897-December, 1898; U. S. Assistant Engineer, Departments of Sewers and Water Works, Havana, Cuba, January, 1899-September, 1899; Professor of Science and Mathematics, Powhatan College, Charlestown, W. Va., September, 1901-September, 1902; Consulting Practice and Associate Editor of the American Electrician, New York City, September, 1902-November, 1905; engaged in Electric Railway work in Ohio, December, 1905-April, 1906; Electrical Engineer in Charge of Calculating and Testing Departments, Mechanical Appliance Co., Milwaukee, Wis., April, 1906-October, 1907; Appointed Professor of Engineering, University of Montana, October, 1907.

ELOISE KNOWLES, Ph. B. . . . . South 2d St. West

Instructor in Drawing.

Boston Art School, 1892-1893; Ph. B., University of Montana, 1898; Chase Art School, Shinnecock Hills, 1899; School of Education, University of Chicago, 1904; Art Institute, Chicago, 1904; abroad part of 1903 and 1906; Instructor in Drawing since 1898.

MRS. BLANCHE WHITAKER. . . . 322 S. 5th St East

Director School of Music.

Educated in England in Private Schools, taking by examination the Degree of Associate in Arts of the University of Oxford. Her musical training was under Dr. Cedric Bucknall and Edward Roeckel. Her professional career began in 1888, and she has been Dean of Music in the University of Montana since 1896.

RUTH ELISE KELLOGG, M. O. . . . . 310 S. 5th St. East

Instructor in Elocution and Physical Culture.

M. O., Manning College of Oratory, Dramatic Art and Music, 1900; Instructor in Elocution, University of Montana, since 1901.

ALBION G. FINDLAY, A. B. . . . . . University Ave.

Director of the Gymnasium and Instructor in Geology.

A. B., University of Wisconsin, 1906.

MARY STEWART, A. B. . Woman's Hall, University Grounds

Dean of Women and Instructor in Latin and German.

A. B., University of Colorado, 1900; Instructor in State Preparatory School, 1900-1901; Principal of Longmont High School, Colorado, 1901-1905; Instructor in East Denver High School, 1905-1907; Dean of Women in University of Montana since 1907.

GERTRUDE BUCKHOUSE, B. S. . . . . 120 S. 5th St. West

Librarian.

B. S., University of Montana, 1900; Illinois State Library School, 1900-1901; Special Course in Government Documents, Wisconsin State Library Commission, 1902; Librarian, University of Montana, since 1902.

JAMES H. BONNER, B. S. (in M. E.) . . 438 W. Spruce St.

Assistant in Mechanical Engineering.

HARRIET L. KUTCHIN, M. A. . . . . . . 324 Ford St.

Assistant in Biology.

AGNES LA FOY FAY, M. S. . Woman's Hall, University Grounds
Fellow in Chemistry

ARTHUR I. MORGAN. . . . . 334 W. Cedar St.
Assistant in Preparatory School.

FREDERICK GREENWOOD. . . . . . 124 S. 5th St. West
Assistant in Preparatory School.

HERMAN C. McGREGOR. . . . . 314 Madison St.
Laboratory Assistant in Engineering.

ORAL J. BERRY. . . . . Prescott's Cottage
Laboratory Assistant in Physics and Geology.

WILFORD WINNINGHOFF. . . . . Prescott's Cottage
Laboratory Assistant in Chemistry.

MILLARD BULLERDICK. . . . . . 709 S. 5th St. West
Laboratory Assistant in Biology.

MONTANA BUSWELL. . . . . 1010 Vine St.
Assistant in Art.

EDNA ROSEAN. . . . . . Woman's Hall, University Grounds
Assistant Librarian.

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GENERAL INFORMATION

HISTORICAL SKETCH

The University of Montana had its origin in a grant of seventy two sections of land made by the federal government to the state of Montana for University purposes. It was provided that the land should be used to form a principal that could never be diminished, and the income from which would form a fund to be applied to the maintenance of the University.

The land selected for the University was amongst the best in the state, and as a result it almost at once began to bring in a revenue. This revenue arises from three sources—leases, licenses to cut timber and the interest arising from the investment of money derived from the sale of lands. It was in this way that the money was accumulated that was used for opening the University in 1895.

The legislative act providing for the organization of the University bears date of February 17, 1893. In accordance with the provisions of the state constitution this act placed the University under the control of the State Board of Education. This act also gave general directions concerning the organization of the different departments of the University, the courses of instruction, duties of the president, fees, etc.

At the December meeting, 1894, the University committee of the State Board of Education reported in favor of opening the University in September, 1895. In order to facilitate the opening of the University the citizens of Missoula donated the use of their elegant and commodious South Side public school building to the state until permanent buildings could be constructed. About $3,500 was spent in improving this building and in putting it in proper order for the use of the state. The amount was raised by special tax, levied for this purpose.

A local executive committee was appointed to assist the board in their work. This committee consisted of J. H. T. Ryman, Judge Hiram Knowles and Col. T. C. Marshall, all of Missoula. This committee has served until the present time without any change in its membership.

The University was formally opened with appropriate ceremonies on Wednesday, September 11, 1895.

Arbor Day, 1896, is a memorable day in the history of the University. On this day the beautiful grounds, donated to the state by Mr. E. L. Bonner and Mr. F. G. Higgins, were dedicated to University purposes. The grounds, comprising forty acres, had already been fenced by the Missoula Board of Trade. Five hundred shade trees were planted. These exercises were partici-

pated in by a large concourse of school children, civic societies and citizens.

The Legislative Assembly of 1897 gave the University authority to issue bonds to the amount of $100,000, bearing not more than 6 per cent interest, due in thirty years and payable in twenty. These bonds are secured by the income from the University land.

The bonds were sold at a premium, a building commission appointed, and the work of constructing the buildings vigorously pushed to completion.

An ample sewerage system was planned and completed, and an abundant water supply secured.

Two buildings were then constructed, one known as University Hall, containing the library, museum, biological lecture room and laboratory, president's office, assembly room and class rooms; the other, known as Science Hall, contains the necessary rooms for work in chemistry, physics and mechanical engineering. Science Hall also contains the steam plant for heating the buildings and furnishing power for the mechanical laboratory.

The interiors were planned with especial reference to the present needs of the University, as indicated by the work already in progress, as well as to anticipate future demands. These buildings were completed and formally presented to the State Board of Education, February 18, 1899.

The Legislative Assembly of 1901 authorized the issuing of $70,000 additional in 5 per cent bonds, due in thirty years and payable in twenty. It was also provided that $40,000 of these bonds should be issued at once and the remainder at the discretion of the State Board of Education. With the proceeds of this bond issue Woman's Hall and a Gymnasium were erected and equipped.

Before the $30,000 issue was sold the Attorney General of Montana gave an opinion, which was sustained by the Supreme Court of Montana and also by the Supreme Court of the United States, that the income from the lands could not be applied to the interest on bonds, but must be devoted to the maintenance of the University.

In accordance with this decision the General Assembly of 1907 passed an act looking towards the assuming of this bonded debt by the state, and the payment of the interest due. An act was also passed granting the University an appropriation of $50,000 for a Library building, and $10,000 for the enlargement of the heating plant and other improvements.

THE UNIVERSITY CAMPUS

The University Campus is forty acres in extent, and lies near the southeastern limit of the city of Missoula, at the base of the

hills which enclose the eastern end of the valley. To the north lies the Missoula river; westward stretches a wide plain, whose western and southern horizons are bounded by the Bitter Root Mountains. A substantial beginning has been made toward the improvement of the campus. A double row of trees was planted along the north, west and south sides ten years ago. Near the center an oval lawn of about three acres in extent is marked out by a broad graveled driveway; around this is a sidewalk, with a space between the walk and the driveway for grass, flowers and shrubbery. The entrance to this driveway is at the western side, from University avenue.

A double row of trees is planted around the drive, one on the lawn around the inner edge of the drive, the other on the outer side of the walk. The trees and the lawns started around the buildings and within the oval have made an excellent growth and already present a beautiful appearance.

BUILDINGS.

University Hall, the largest building, stands on the east side of the oval, directly opposite the entrance to the driveway and facing the west. A little to the south stands Science Hall, which faces toward the northwest. Still farther west, and directly south of the oval, is Woman's Hall. To the northeast of University Hall and at a distance of two hundred feet is the gymnasium. The new library building is situated on the north side of the oval. With the exception of the gymnasium, all these buildings face the large oval near the middle of the campus.

University Hall is 140 by 65 feet in its ground dimensions, and its central tower rises to a height of one hundred and twelve feet. This building has four floors, including the basement, which is so largely above the ground as to be well lighted and fit for any sort of use. The basement walls are of granite; above rise double brick walls of the most substantial character; the inner partition walls are also of brick.

Throughout the building, from basement upwards, is a uniform handsome finish of dark tamarack and white pine wainscoting, in alternate strips; above this are white plaster walls.

The whole building contains thirty-one rooms, without including six small rooms in the rear of the Assembly Hall—three on the second and three on the third floor. These rooms furnish a passageway from one end of the building to the other, without going through the Assembly Hall, and may also serve as cloak rooms; those on the second floor give access from the rear to the platform of Assembly Hall.

The most important of these rooms in University Hall are the Assembly Room, Library, Museum, Literary Society Hall,

Offices, Biological Laboratory and seven lecture rooms of uniform size, for the departments of History, Drawing, Biology, Mathematics, Literature, Modern Languages and Ancient Languages.

Science Hall contains in the first floor eight rooms, a lecture room and laboratory for the department of Physics; and an office, a drawing room, a wood working shop, a machine shop, a forge room and a foundry room for the department of Mechanical Engineering. The chemical and geological laboratories, and chemistry lecture room are on the second floor.

In the basement are the boilers for the heating plant of all the buildings and the engine which runs the machinery of the shops.

The Woman's Hall was constructed to furnish a home for students. It is 136 by 46 feet in its ground dimensions and has four floors, including the basement, which is so largely above ground as to be well lighted.

In the basement are the dining room, laundry room, storage rooms, etc. The first floor contains the office, parlors and some students' rooms. The second and third floors are entirely devoted to students' rooms. On each floor are closets and bath rooms. The entire building is well furnished and amply supplied with electric lights, steam heat and every sanitary convenience. It is designed to accommodate 72 students.

The Gymnasium, north of University Hall, is 114 by 58 feet in its ground dimensions. The main unbroken gymnasium floor is 114 by 43 feet. In the rear of this are the dressing and bath rooms for men and for women. These are supplied with hot and cold water, and the building is lighted by electric lights and heated with steam radiators. In the rear of the building, facing the track and athletic grounds, is a commodious and comfortable grandstand.

The new Library building, 86 by 56 feet, when completed, will contain the general library. There will be ample room for book-shelves, pleasant reading rooms and alcoves for reference books. The basement of the building will accommodate the geological museum. The building will also contain lecture rooms and offices for the departments of History, English and Rhetoric, Physics and Geology, and Literature.

THE UNIVERSITY AND ITS ENDOWMENT

The University of Montana was created by an act of the Montana State Legislature, approved February 17, 1893. The following extracts give the title of the act, and also certain sections that indicate the purpose of the University and the scope of its work.

"An Act to establish, locate, maintain and govern the University of the State of Montana.

"Section 1. There is hereby established in this State at the City of Missoula an institution of learning under the name of and style of the University of Montana."

"Section 6. The object of the University of Montana shall be to provide the best and most efficient manner of imparting to young men and young women, on equal terms, a liberal education and a thorough knowledge of the different branches of Literature, Science and the Arts, with their varied applications; and to this end there shall be established the following colleges or departments, to-wit:

"First—A Preparatory Department.

"Second—A Department of Literature, Science and the Arts.

"Third—Such professional and technical colleges as may from time to time be added to or connected therewith.

"The Preparatory Department may be dispensed with at such date and in such wise as may seem just and proper to the State Board of Education.

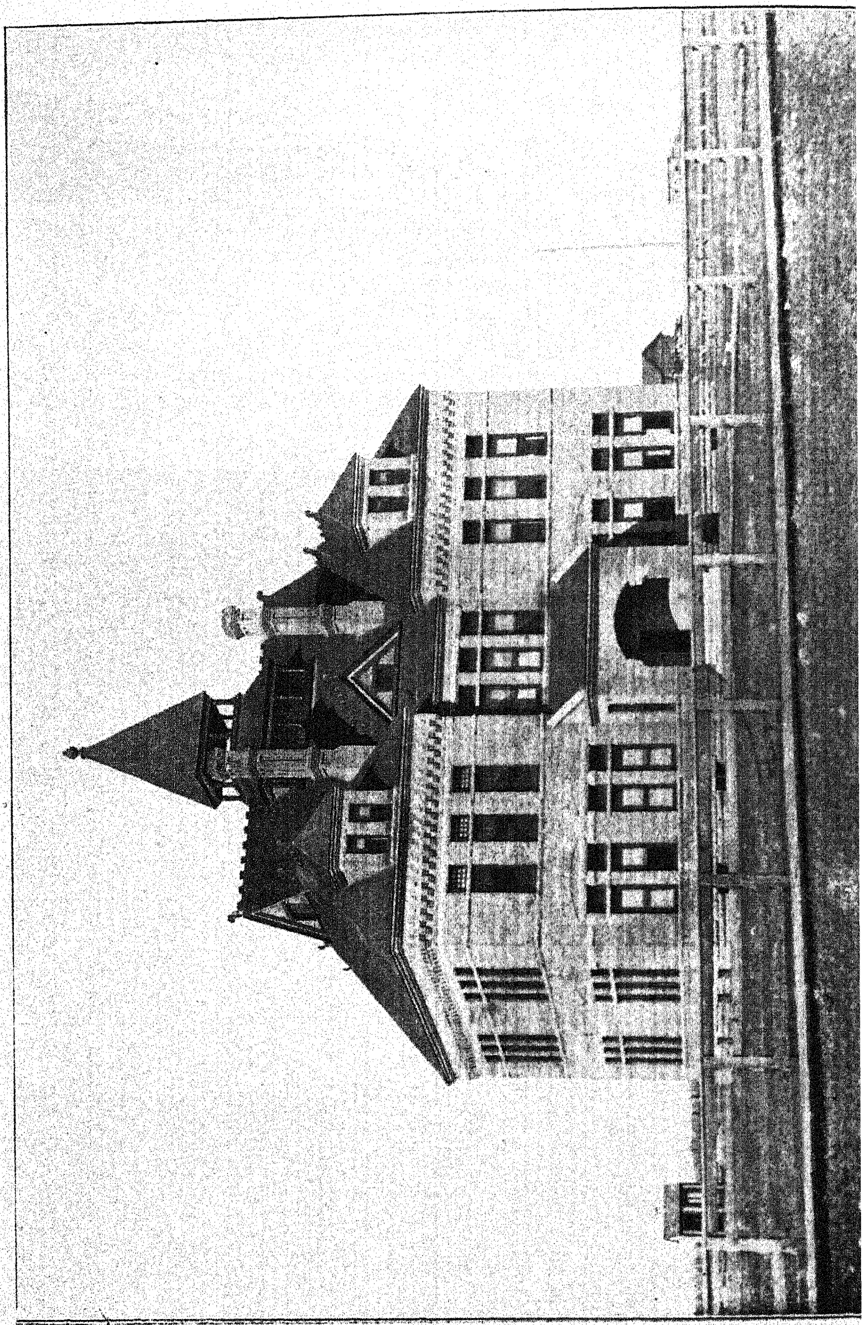
"Section 7. Such duties or courses of instruction shall be pursued in the Preparatory Department as shall best prepare the students to enter any of the regular colleges or departments of the University.

"The college or department of Literature, Science and the Arts shall embrace courses of instruction in Mathematical, Physical and Natural Sciences with their applications to the Industrial Arts; a liberal course of instruction in the Languages, Literature, History, Philosophy and such other branches as the State Board of Education may prescribe. And, as soon as the income of the University will allow, and in such order as the demands of the public seem to require, the said courses of instruction in the Sciences, Literature and the Arts shall be expanded into distinct colleges or departments of the University, each with its own faculty and appropriate title."

"Section 9. Tuition shall ever be free to all students who shall have been residents of the State for one year preceding their admission; except in the Law and Medical Departments, and for extra studies. The State Board of Education may prescribe rates of tuition for any student in the Law or Medical Department, or who shall not have been a resident as aforesaid, and for teaching such studies."

ENDOWMENT.

"Section 10. For the support and the endowment of the University there is annually and perpetually appropriated—



not regularly drawn out) must return it to the Librarian before leaving the room.

3. Books not marked "Reference Book" may be drawn from the Library and retained one week, and then may be re-drawn for another week; but no books may be kept by one person longer than two weeks.

4. If a book is not returned within the week for which it was drawn, the holder shall be subject to a fine of 10 cents; if not returned within two weeks from the time it was drawn, a fine of 25 cents; if not returned within a month, a fine equal to the price of the book.

5. Reference books, current periodicals and papers cannot be taken from the Library room except by special permission of the Librarian, and then only from the closing of the Library to the first succeeding hour of opening.

6. A violation of any of the foregoing regulations, or other rules which may from time to time be prescribed, may forfeit a student's right to the use of the Library for such time as may be designated.

7. No student may have in possession from the Library at any one time in any one line of work more than two books, except that the Librarian may in special cases allow additional volumes to be drawn on the recommendation of the professor in charge.

8. It is the duty of the Librarian to enforce the above regulations.

The following is a list of the periodicals on file for the use of members of the University:

American Antiquarian.
American Architect.
American Chemical Journal.
American Journal of Psychology.
American Journal of Science.
American Journal of Physiology.
American Machinist.
American Mathematical Monthly.
American Mathematical Society, Bulletin.
American Naturalist.
American Physical Educational Review.
Analyst.
American School Board Journal.
Analytische Chemie, Zeitschrift Fur.
Annals and Magazine of Natural History.
Anorganische Chemie, Zeitschrift Fur.
Anorganischen Chemie.
Archaeology.
Associated Engineering Societies, Journal of.
Athenaem.
Atlantic Monthly.
Auk.

Biblical World.
Bird-Lore.
Book Buyer.
Bookman.
Botanical Gazette.
Brick.
Brush and Pencil.
Cassier's Magazine.
Century.
Chautauquan.
Chemisches Central Blatt.
Chemisches Societe de Paris.
Classical Journal.
Classical Philology.
Classical Review.
Contemporary Review.
Cosmopolitan.
Craftsman.
Critic.
Current Literature.
Deutsche Rundschau.
Dial.
Economic Geology.
Education.
Electrical Review.
Electrical World.
Electrician.
Educational Review.
Engineering (London).
Engineering Magazine.
Engineering News and American Railway Journal.
Engineering and Mining News.
Entomological News.
Fels zum Meer.
Fliegende Blatter.
Forest and Stream.
Foundry.
Genera Insectorum.
Gute Kamerad.
Harper's Magazine.
Harper's Weekly.
Jahrbuch uber die Fortschritteder Mathematik
Journal de Mathematiques.
Journal of American History.
Journal of American Chemical Society.
Journal of Chemical Society (London).
Journal of Geology.
Journal of Sociology.
Journal of the Royal Microscopical Society.
Ladies' Home Journal.
Library Journal.
Literary Digest.
Literary World.
Living Age.
Literary News.
McClure's.
Masters in Art.
Mathematics.

Mind and Body.
Mines and Minerals.
Mining World.
Monist.
National Geographic Magazine.
Nature.
Die Naturlichen Pflanzenfamilien.
Nautilus.
Neurology, Comparative.
N. Y. Botanical Garden.
Nineteenth Century.
North American Review.
Outing.
Outlook.
Photographic Times (Bulletin).
Physical Review.
Plant World.
Poet Lore.
Political Science Quarterly.
Popular Science Monthly.
Power.
American Journal of Psychology and Scientific Methods.
Psychological Bulletin.
Psychological Review.
Public Libraries.
Public Opinion.
Public Library Quarterly.
Public School Journal.
Publishers' Weekly.
Queen's Quarterly.
Quarterly Journal of Pure and Applied Mathematics.
Railway and Locomotive Engineering.
Reader's Guide to Periodical Literature.
Review of Reviews.
School and Home Education.
School of Mines Quarterly.
School Review.
School, Science and aMthematics.
Science.
Scientific American and Supplement
Scribner's
Success.
Torreya.
Uber Land und Meer.
Torrey Botanical Club (Bulletin).
World's Work.
Zeitschrift fur Wissenschaftliche Mikroscopie.
Zoologischer Anzieger.
Zoologist.
Anaconda Standard.
Helena Independent.
Butte Miner.

The following papers are donated by their respective publishers:

Belt Valley Times.
Basin Progress.
The Big Timber Pioneer.

The Yellowstone Leader, Big Timber.
The Billings Times.
The Age-Sentinel, Boulder.
The Billings Daily Gazette.
The Belfry News.
The Avant Courier, Bozeman.
The Tribune Review, Butte.
The Butte Evening News.
The Butte InterMountain.
The Reveille, Butte.
The Chinook Opinion.
The Conrad Observer.
The Dillon Examiner.
The Dillon Tribune.
The Forsyth Times.
The Glendive Independent.
The Western News, Hamilton.
Ravalli Republican.
The Valley County News, Glasgow.
The Havre Herald.
The Havre Plaindealer.
The Kalispell Bee.
The Inter-Lake, Kalispell.
The Montana Daily Record.
The Independent, Miles City.
The Madison County Monitor.
Madisonian, Virginia City.
The Philipsburg Mail.
The Plainsman.
Pony Sentinel.
The Rocky Mountain Husbandman.
The Rocky Mountain Leader, Boulder.
The Silver State.
The Stevensville Register.
The Northwest Tribune, Stevensville.
River Press, Fort Benton.
Rosebud County News.
The Choteau Acantha.
Rocky Mountain Leader.

STATEMENT.

Number of volumes in the Library	18,946
Number of pamphlets	7,941
Number of periodicals regularly received	176

THE MUSEUM

THE ROOMS

The Museum proper is on the first floor of the main building. One room in the basement is allotted for storage of the collections, and is packed full. The Museum is filled with cases,

along the walls and in the interior. The cases are made of native lumber after the best patterns, and display the collections to advantage. The walls are covered with insect cases containing mounted insects. Above the cases toward the ceiling are arranged the agricultural exhibits received from the Omaha Exposition, the large mounted fishes, collected and donated by Mr. R. A. Eddy, and the mounted birds of large size.

The Geological and Biological storeroom in connection with the Museum is located in the basement of University Hall and has for the storing of specimens shelves built on the four walls. These shelves are almost entirely filled. Part of this valuable storeroom collection has been named and catalogued, but owing to lack of space in the Museum proper very little has been put out. However, as soon as more room is offered the Museum will have a showing second to none in the Northwest.

The Museum material not stored in the room set apart for the collections is housed in the different departments. Indeed, much of it is indispensable to department work. As a result much of the Museum is scattered. Considering the time during which material has been gathered, and the amount expended, the collections have made remarkable growth.

The intention is to make the Museum a depository of the material representing the natural, mineral and scientific wealth of the state.

COLLECTIONS.

The collections of the Museum, from various sources, are as follows: A collection of over a thousand bird skins, almost entirely from the state; a collection of shells, partly collected in the state, and partly through donations from several sources; a collection of plants, embracing about 3,000 species, with many thousand duplicates, received largely through donations, by collecting and from the exhibit at Omaha; a collection of insects, partly through purchase, but largely by collecting; a collection of fossils, almost entirely from the state, partly donated and for the remainder collected; a collection embracing money, historical relics, souvenirs and promiscuous articles; a collection of fishes, partly from the U. S. Fish Commission, the remainder collected in the state; a collection of fresh water entomostraca from the lakes and rivers of Montana; a collection embracing coals, rocks, concentrate samples, building stones, brick, tile and pottery, developed and produced in the state; a set of the series of educational rocks prepared by the U. S. Geological Survey; the Wiley collection of over a thousand species of Lepidoptera.

During the past year much work has been done on the Museum collections. Many hundreds of insects have been arranged permanently in Comstock insect cases, more than a hundred of these cases being now required to house the collection, with a large number as yet in papers.

Drawer space has been arranged for the collection of bird skins, now numbering more than a thousand, and the collection is now systematized so as to be accessible for any species.

Many hundreds of botanical specimens have been mounted, and all the identified Montana specimens have been systematically arranged in the case made especially for the collection, and are easily accessible. This work is being continued as fast as possible.

A shipment of glassware has been received from a German firm for displaying the alcoholic material that has accumulated and is not placed on exhibition. The containers are square boxes, with lids ground to fit. The boxes display the material to the best advantage, without the distortion so noticeable in round containers. The material already placed in these boxes makes a handsome exhibit.

A supply of paper-lined pasteboard trays is kept on hand, and the various collections as they come in are placed in these neat trays, are properly labeled, and are shown to the best advantage.

It is most earnestly requested that all who are interested in the University, and especially in the preservation of valuable material for scientific work, should take special pains to contribute to the material in the Museum. Time and circumstances are fatal to nearly all specimens, but being properly cared for and placed in the Museum of the University they will be preserved.

The University has come into possession of the insect collection of the late C. A. Wiley of Miles City. It embraces over a thousand specimens of Lepidoptera. Most of these are from the eastern end of the state, but many obtained by exchange. It is thus rich in native species from the state, and at the same time has many of the showy forms from Europe and the Orient. This is a great addition to the entomological collection of the University, and together with those gathered from other sources gives the University an excellent exhibition of Lepidoptera, as well as a fine series for student study.

Many mineral, rock and fossil specimens were added to the museum during the past year, both by collecting and purchase.

The following are a few of the best collections:

1.—A splendid set of minerals from Joplin, Missouri. This set includes specimens of all of the minerals and gangue rocks of the famous lead-zinc region known as the Joplin District.

2.—Products of the Butte Sewer Pipe and Tile Company's Plant at Butte, Montana.

3.—A large collection of minerals for advanced work in mineralogy.

4.—A good collection of lead-silver ores from the Coeur d'Alene Mining District.

5.—Many rocks, minerals, and fossils from the Summer Geological Expedition.

Correspondence is solicited concerning material which may be donated. All donations will be properly acknowledged, and the articles properly labeled and the donor's name recorded.

Collegiate Departments of Instruction

NOTE—Roman numerals indicate the number of the course; Arabic indicate the number of recitations per week. Courses extend through one semester.

HISTORY AND ECONOMICS

The courses in History impart knowledge of the economic conditions and organization of periods and of nations as a basis for a study of political institutions and of social evolution. Discipline in the methods of research is obtained from copies of original documents, laws, treaties, journals and reports.

The courses in Economic Science apply the historical method to the study of present day institutions and problems. Since it is believed that present problems cannot be intelligently considered without some knowledge of historical evolution, it is hoped that these courses will be preceded and accompanied by as many historical courses as possible.

HISTORY

I. EUROPEAN HISTORY.—The economic bases and the development of political and ecclesiastical institutions; the disintegration of the Roman empire; the Germanic settlement and contribution to modern institutions; feudalism; the beginnings of modern nationality; the Renaissance and the Reformation.
First semester; three hours.

II. EUROPEAN HISTORY.—The economic and political evolution of the modern European states; the ecclesiastical wars; the causes and consequences of the Revolutionary period; national unity; the growth of democracy in the Nineteenth century; Europe at the beginning of the Twentieth century.
Second semester; three hours.
A text book will be used in courses I and II, supplemented by informal lectures and library reading.

III. ENGLISH HISTORY.—The development of economic and political institutions from their primitive origins to the unity of Tudor absolutism; the racial composition of the English people; social history.
First semester; three hours.

IV. ENGLISH HISTORY.—The development of constitutional government from the revolutions of the Seventeenth century to the political and industrial revolutions of the Eighteenth century, and the development of democracy in the Nineteenth century; social history; parliamentary government.
Second semester; three hours.

V. AMERICAN HISTORY.—The development of American eco-

nomic and social organization and the sources and establishment of the constitution; the journals, the "Federalist" and the writings of the early statesmen as interpretations of American political ideas; the history of the early administrations.

First semester; three hours.

VI. AMERICAN HISTORY.—The historical and judicial interpretation of the constitution; the history of political parties and political theories; reconstruction; industrial evolution and the relation of economic conditions to political conflicts and ideas, with a view to understanding present day problems.

Second semester; three hours.

Courses III-IV and V-VI will be given in alternate years. Courses III-IV will be given in 1908-9. These courses will be by lectures, supplementary reading and the discussion of student researches.

ECONOMICS

I. ECONOMICS.—Introductory course. The fundamental laws of the production and distribution of wealth as developed in economic theory; comparison and criticism of economic theories; illustrations of economic organization from current industrial life. Text book, lectures and discussion.

First semester; three hours.

II. CURRENCY AND BANKING.—The theory of money; history and present organization of the American monetary system; the theory of credit and the history and description of the banking system of the United States; the conditions of a sound financial system and present financial problems.

Second semester; three hours.

III. PUBLIC FINANCE.—The science of public finance; the revenues; the preparation of the budget; the financial administration. Theory of taxation; shifting and incidence of taxes; the present system of taxation; proposed reforms.

Second Semester; three hours.

IV. BUSINESS ORGANIZATION.—The character and methods of typical business activities, manufacturing and distributive; credits; collections; advertising. Methods of corporation promotion, underwriting, marketing, accounting, reorganizing, receiving. Speculation; stock exchanges; the remedies for evils of corporate finance.

Second semester; three hours.

One of courses II-III-IV will be given each year.

V. ECONOMIC EVOLUTION—The historical analysis of industry and property; the evolution of methods of production and distribution from antiquity to the Nineteenth century, with especial reference to the industrial development of the United States, preparatory to an understanding of present economic problems. Prerequisite: Economics I.

First semester; three hours.

VI. ECONOMIC PROBLEMS.—A consideration of the problems of corporate organization, of wages and pauperism, and of the ideals and institutions for social reform and of equitable distribution, in the light of economic theory and the history of property. The relation of government to industry. The co-operative trend. Prerequisite: Economics I.

Second semester; three hours.

VII. POLITICS.—A study of the structure and powers and current operation of American institutions, state and national; the "unwritten constitution"; government by parties; current politics; the principles of political obligation; Montana government. Text book, lectures and discussions.
First semester; three hours.

VIII. SOCIOLOGY.—The elements and evolution of society; social forms and social forces, physical and psychical; social control; examination, contemporary society; the collection and analysis of live sociological material—newspapers, reviews, and the community. Introduction to social psychology. Prerequisite: Course I in Economics and at least one year in history.
Second semester; three hours.

IX. SOCIOLOGY-APPLIED—The application of sociological principles to the study of contemporary organizations, industrial and social; the causes and cures of abnormal social conditions; the instrumentalities of social betterment; public and private philanthropy; methods of sociological study and endeavor.
Second semester; three hours.
Courses V-VI and VII-VIII or IX will be given in alternate years. Courses VII-VIII or IX will be given in 1908-9.

X-XI. SEMINAR.—The discussion of political and social questions of the present with reference to their historical significance and the discussion of researches by advanced students of history and political science.
First and second semester.

The department will secure a series of addresses on business and political questions by practical business men and public men.

DEPARTMENT OF PHILOSOPHY AND EDUCATION

GENERAL INFORMATION

The best introduction to work in this department is obtained from Courses I and II. Usually students will not be admitted to other courses until they have completed one semester in Psychology. It is hoped the department may be found helpful in two ways: First, to all advanced students by assisting them to coordinate the results acquired from other studies and from their own thinking; second, to all students who expect to become teachers, by laying the foundation of all professional training.

COURSES IN PSYCHOLOGY

Courses in Philosophy and Education are not open to first year students. Courses III, VI, VII, VIII, IX, X, XIV and XV are given on alternate years. This year Courses III, VIII, X, XIV will be omitted.

I. GENERAL PSYCHOLOGY.—An introductory course. Lectures, text book and demonstrations. First semester. M., W., F. 9:30. Required of all students for A. B. or B. S. degrees.

II. EXPERIMENTAL PSYCHOLOGY.—Typical experiments from the various manuals upon sensation, perception, attention, association, memory, movement, affective expression, imagery, rhythm, fatigue, learning, etc. Lectures and discussions interspersed as needed. Five hours per week. Two hours credit. Second semester. T., Th. 1:30-4:00. Open to students who have passed in course I and required for A. B. and B. S. degrees.

XI. GENETIC AND APPLIED PSYCHOLOGY.—A study of the gradual unfolding of the mind in the animal series and in the child; the role of consciousness in biological evolution; origin and development of instincts, habits and intelligence; some applications of Psychology in Pedagogy, Law and Medicine. Recitations and lectures. Second semester. M., W., F. 9:30. May be taken in connection with course II.

XII. ADVANCED PSYCHOLOGY.—Original investigations in Experimental or Educational Psychology. The student will be encouraged to take up problems in which he can make a real contribution to science, and the results collected in the form of a thesis which, if worthy, will be published. Open to advanced and graduate students. Throughout the year at an hour to be arranged. Two or more credits, according to work done.

XVI. PSYCHOLOGICAL SEMINARY.—Members meet once a week for discussion of general topics selected for study at the beginning of each semester. There will be readings, discussions and reports of researches. First and second semesters. Open to all special students of Psychology and Education. Two hours credit.

COURSES IN PHILOSOPHY

VI. LOGIC.—Recitations and exercises in logical analysis, with a study of Scientific Method. First semester. T., Th., at 8:30.

VII. ETHICS.—Lectures and assigned readings. Second semester. T., Th., at 8:30.

III. INTRODUCTION TO PHILOSOPHY.—A general survey of the fundamental problems of Philosophy. Should be preceded by elementary courses in the biological and physical sciences. Open to students who have taken course I. First semester. T., Th., at 8:30. Omitted 1908-9.

Hibben, Problems of Philosophy.
Paulsen, Introduction to Philosophy.

X. HISTORY OF PHILOSOPHY.—An introductory course. First semester a general survey of the intellectual work of the Ancients, with a more careful study of Plato and Aristotle. Second semester enough of Mediaeval thought will be reviewed to show the historic connection between the ancient and modern views. Special attention will be given to a few great thinkers in modern times—Descartes, Hume, Kant, Spencer, etc. Lectures and discussions. M., W., F., at 8:30. Must be preceded by or taken with course III. Omitted 1908-9.

Weber's History of Philosophy used as a text.

COURSES IN EDUCATION

It is the purpose of the work in Education to give such instruction in the principles and history of education as a truly liberal humanistic culture requires and to provide adequate professional preparation for those University students who intend to teach. Students intending to pursue work in Education or desiring the University Certificate of Qualification to teach are urgently advised to begin their Psychology in their second year. This should be followed by an elective course in Philosophy the Junior year, leaving the electives for the teacher's certificate for the Senior year. All courses in education must be preceded by Courses I and II.

IV. HISTORY OF EDUCATION.—An outline of the leading educational ideals and practices from earliest times to the present. Special attention will be given to a few great influences and to the work of such educational reformers as Socrates, Comenius, Pestalozzi, Froebel, Horace Mann, and G. Stanley Hall. Open to third and fourth year students. Should be supplemented by Course V. First semester. M., W., F. 11:30. Monroe Text Book on History of Education.

V. EDUCATIONAL CLASSICS.—It is the purpose of this course to supplement the work of Course I by studying more intensively the life-work and classical productions of a few great educators. Two or more of the following books will be studied: Plato's Republic,Locke's Thoughts Concerning Education, Rousseau's Emil, Pestalozzi's Leonard and Gertrude, Froebel's Education of Man, Spencer's Education. To be taken with or preceded by Course IV. First semester. T., Th. 11:30.

XIV. HIGH SCHOOL PEDAGOGY.—For students who wish to prepare to teach in the high school. The history and general principles of high school methods and discipline. Relation of secondary schools to the higher and lower schools. The psychology of adolescence, and adaptation of the high school to the needs of different careers; the course of study. General history of secondary education; its present organization in the different countries of Europe; the history of secondary education in the United States. Second semester. M., W., F. 10:30. Omitted in 1908-9.

VIII. PRINCIPLES OF TEACHING.—Studied from the standpoint of present-day Psychology and recent studies in Experimental Pedagogy. The chief emphasis will be placed on the psychology of teaching and learning, instead of on methods of teaching the various school subjects. Thorndike's Principles of Teaching used as text. Second semester. T., Th. 10:30. Omitted 1908-9.

IX. EDUCATIONAL PSYCHOLOGY.—The lectures and readings in this course will cover some of the more important chapters in psychology in their educational aspects, such as habit, attention, memory. Education of the senses. Apperception and association. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Motor education and education of the will. Certain aspects of mental hygiene and hygiene of instruction. Second semester. M., W., F. 10:30.

XV. STUDY OF CHILDREN.—An investigation of the development of the individual from birth to maturity, with special reference to means and methods of education. The development of consciousness and the Psychology of Learning will be made the central theme of the course. Lectures, assigned readings and text book work. Second semester. T., Th. 10:30.

DEPARTMENT OF ENGLISH AND RHETORIC

FIRST SEMESTER

I. RHETORIC.—A course in composition and rhetoric. Required of all first year college students. Prerequisite to all other courses in English and rhetoric, and to all courses in literature. M., T., W. 9:30.

III. ARGUMENTATION.—Study of argumentation with a view of the acquisition of an effective style in debate. Practice in brief-writing. Open to a limited number of students. M., W. 10:30.

V. VERSIFICATION.—Study of the forms of English verse. Topics assigned for individual study and reports. T., Th. 10:30.

VII. OLD ENGLISH.—Selections in old English translated into modern English. Some work in historical English grammar. Open to students who have had one semester of German. M., Th. 11:30.

IX. HISTORY OF THE ENGLISH LANGUAGE.—An elementary course in English philology. A basis for the study of English grammar. T., F. 11:30.

XI. MYTHS AND BALLADS.—A course for graduate students. F. 9:30.

SECOND SEMESTER

II. DESCRIPTION.—Critical study of literary models. Frequent written exercises. T., Th. 9:30.

IV. NARRATION.—Critical and constructive work in short-story writing. M., W., F. 9:30.

VI. PROSE.—Study of English prose style. Topics assigned for individual study and reports. T., Th. 1:30.

VIII. MIDDLE ENGLISH.—Selections from Chaucer. M., F., 11:30.

X. BALLADS—Selections from early English popular poetry. T., Th. 11:30.

XII. MYTHS AND BALLADS.—(Continued from First semester.) Hour to be arranged.

DEPARTMENT OF LITERATURE

COURSES IN LITERATURE

I. ENGLISH LITERATURE.—History and development of English Literature in outline. Open to all students. First semester. Rec., T., Th. 1:30.

II. ENGLISH LITERATURE.—Elementary work in essays, poetry, drama and fiction. Open to first year students. Second semester. Rec., T., Th. 8:30.

III. ENGLISH LITERATURE OF THE ELIZABETHAN PERIOD. —This course is the study of Spencer, Marlowe, and Bacon. A brief history of the pre-Shakespearean drama in lectures. Reports on Woodbridge's "Technique of the Drama." Open to all students. First semester. Rec., T., Th. 9:30.

IV. ENGLISH LITERATURE—SHAKESPEAREAN DRAMA.—The critical study of eight plays, so selected as to illustrate the author's range and the variations of his art in the successive periods of his life. Open to students who have completed Course III. Second semester. Rec., M., W., F. 9:30. Lib., T., Th.

V. ENGLISH LITERATURE OF THE EIGHTEENTH CENTURY. —Lectures and written papers. Special attention will be given to the works of Pope, Goldsmith, Gray, Addison and Swift. Text book, Gosse's "History of the Eighteenth Century Literature." Open to all students. First semester. Rec., T., Th. 1:30. Omitted in 1908-9.

VI. ENGLISH LITERATURE OF THE NINETEENTH CENTURY.—Prose—Carlyle, George Eliot, Arnold, Lamb and Ruskin. Lectures on the literature of the Nineteenth century. Open to all students. Second semester. Rec., T., Th. 1:30. Lib., M., W., F.

VII. ENGLISH LITERATURE—Wordsworth, Coleridge, Byron, Shelly, Keats and Scott are studied in representative selections. Open to advanced students. First semester. Rec., M., W., F. 8:30. Lib., T., Th.

VIII. ENGLISH LITERATURE.—Tennyson and Browning—The critical study of selections from Tennyson and Browning, comparing the style, philosophical ideas and theories of the authors. Second semester.—3. Rec., M., W., F. 8:30.

IX. AMERICAN LITERATURE.—A survey of Américan literary history and the discussion of notable works in prose. Open to all students. First semester. Rec., M., W., F. 11:30. Lib., T., Th.

X. AMERICAN LITERATURE.—Selections from the verse of the greatest American poets. Open to all students. Second semester. Rec., T., Th. 11:30.

XI. THE EXTENDED AND CRITICAL STUDY OF THE POEMS OF BROWNING.—Graduate Course.

XII. Some department, subject or figure in literature will be selected as the basis of the work of this course. Graduate Course.

Note.—Rhetoric I is prerequisite to the work in this department.

LIBRARY SCIENCE

The purpose of this course is to give students systematic instruction in the use of the library. An effort is made to familiarize the student with such catalogues, bibliographical aids

and general reference books as will enable him to investigate a subject with intelligence.

Course I. General Reference.—Lectures, reading and reference work. Required of all students. Lectures will be given on the following topics: The arrangement of the library and the privileges granted students, the use and value of the card catalogue, dictionaries and encyclopedias, Poole's index and periodical literature, classification, cataloguing, atlases and gazeteers, note-taking, book-binding and the care of books, government publications, and reference books on English and American literature, history and science. One lecture or recitation per week. One afternoon laboratory work. One hour credit. Either semester.

DEPARTMENT OF VOCAL EXPRESSION

This department offers an opportunity for culture invaluable to all students in the University. It combines the study of the best literature with the art of interpretation and expression. It gives the student control of his own powers and gives him easy, simple and effective delivery.

Courses I and II are required of all students except those in the School of Engineering.

Course I. ELEMENTS OF PRACTICAL ELOCUTION.—Pantomimic action, recitation and oration. First semester. T., Th. 8:30.

Course II. PRACTICAL ELOCUTION.—Recitations from classical writers, Shakespeare, Tennyson, Browning and others. Second semester. T., Th. 8:30.

Course III. PRACTICAL ELOCUTION.—Program construction and production. Program to consist of five or more numbers from varied sources or the works of a single writer.—3 hours.

Course IV. PROGRAM WORK CONTINUED.—Attention will be given to a one theme program.—2 hours.

Course V. ORATION AND DEBATE.—This course is entirely for the production of oration and debate, with special work in extemporaneous speaking.—2 hours.

PREPARATORY ELOCUTION.—This course is offered to preparatory students. The work is suited to the needs of students in this department.—2 hours.

DEPARTMENT OF LATIN AND GREEK

GENERAL INFORMATION

1 The primary aims of this department are the acquisition of such mastery of the languages as to enable the student to read them with some degree of facility, to read the greatest possible

amount of the best Greek and Roman literature, and to make the work subservient to general culture in the English language and literature.

The scope of this department is conceived to include, not only the study of the language and literature of the ancient Greeks and Romans, as narrowly defined, but also some attention to all phases of their civilizations. Without this broader view some of the most important results of classical studies can not be attained. For this reason, the study of the arts, institutions and life of the Greeks and Romans will be given due prominence, and provision has been made for this part of the work.

2. In connection with the prose reading, exercises in writing Latin and Greek will be used. The training in syntax will be largely given in connection with this work.

3. There will be almost daily practice in reading and translating at sight, generally from that portion of the text assigned for the next day's reading.

4. Students are advised to bring with them any Latin and Greek text books they may have, but not to purchase books before definite directions are given. The most essential aids for study, such as maps, charts and works of reference, are provided by the University.

COURSES IN LATIN

I. CICERO.—Selections. Composition based upon the reading. Grammatical review with illustrative composition exercises. First semester. M., W., F. 9:30.

II. CONTINUATION OF COURSE I.—Second semester. M., W., F. 9:30.

III. HORACE.—Selections. First semester.—4 hours. 8:30.

IV. LIVY AND TACITUS.—Selections. Second semester.—4 hours. 8:30.

V. PLAUTUS.—First semester. T., Th., F. 11:30.

VI. TERENCE.—Second semester. T.,Th., F. 11:30.

VII. PRIVATE LIFE OF THE ROMANS.—Required of classical students. Open to all students. Second semester. M., W., F. 1:30.

COURSES IN GREEK

I. A FIRST GREEK BOOK.—Elements of Greek Grammar.—5.

II. FIRST BOOK OF ANABASIS.—Sight reading, writing Greek, study of grammar in connection with the reading and writing.—5.

III. ANABASIS CONTINUED.—Sight reading, writing Greek, grammar with topical outline.—5.

IV. HOMER'S ILIAD.—Selections.—5.

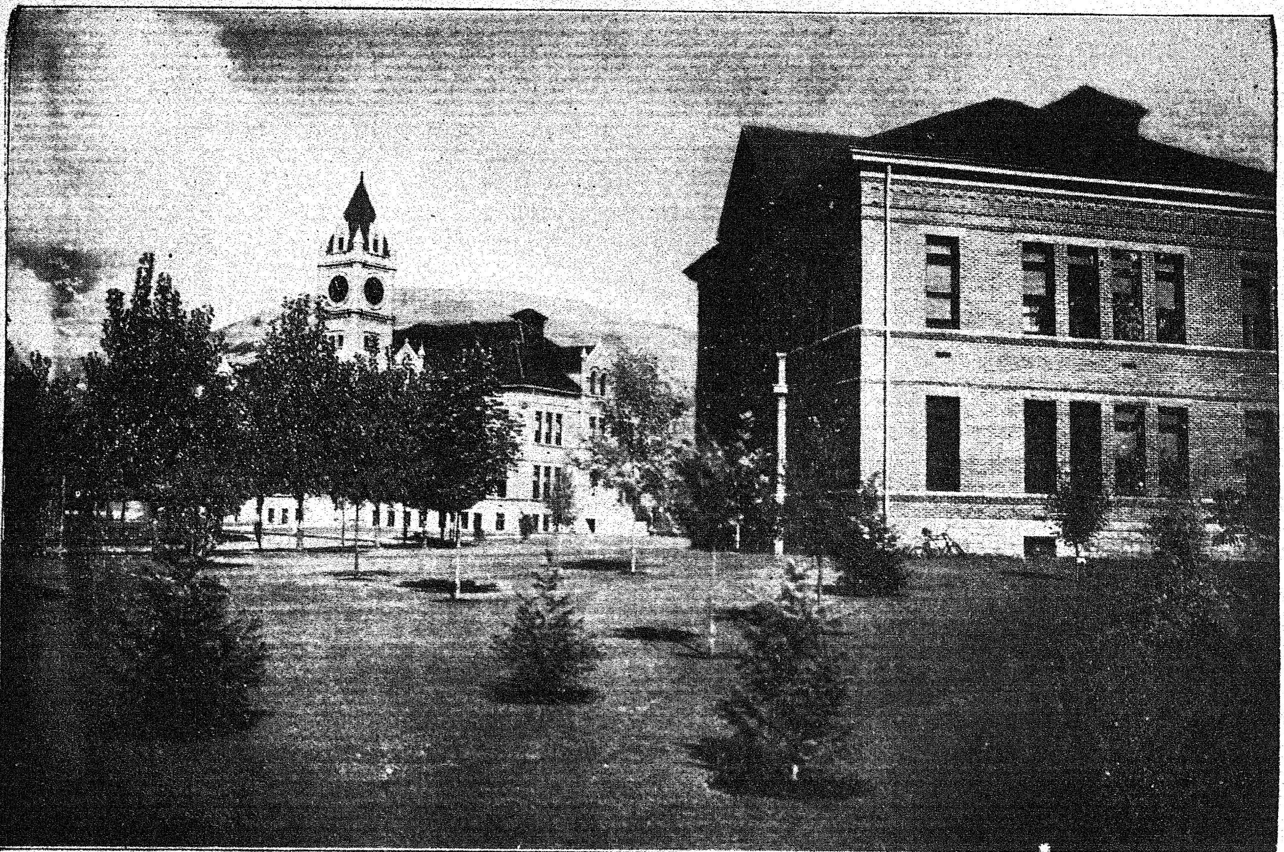
V. HERODOTUS AND THUCYDIDES.—Selections.—5.

VI. DEMOSTHENES.—Selections.—5.

VII. PLATO.—Selections.—5.

VIII. GREEK DRAMATISTS.—One play of each from Aeschylus and Sophocles. Selections from Aristophanes.—5.

IX. PRIVATE LIFE OF THE GREEKS.—Open to all students and required of those taking the classical group of subjects. First semester. M., W., F. 1:30.



UNIVERSITY HALL SCIENCE HALL

DEPARTMENT OF MODERN LANGUAGES

The course has been arranged to give the student a thorough course in grammar, and syntax, with the main aim of preparing the student to be able to read at sight works of medium difficulty, rather than to give him a course of conversation to obtain a fluent speaking knowledge of the languages. The time devoted to the languages is entirely too short to prepare a student thoroughly to speak the language. Conversation is carried on in the second and third years, and in the third year is made a main feature. Extracts from modern authors are read and essays in original language demanded.

COURSES IN GERMAN

The course extends over three years.

I and II (first year) Becker's German Grammar or its equivalent is used. Carruth's German Reader, Bernhardt's Composition, followed by Wilhelm Tell, Drei Kleine Lustpiele or readers of the same difficulty. M., T., W., F. 8:30. 4 credits each.

III and IV (second year). Readers: Wallenstein, Minna von Barnhelm, Schiller's Ballads et al. Sight Readers: Karl Heinrich, Four German Comedies. M., W. F. 11:30. 4 credits each.

V and VI (elective) are devoted to some of the more difficult classics—Ekkehart, Max Mueller, Goethe's Faust—Part I, and extracts from scientific texts, given especially to students taking Chemistry, Geology and other sciences. 3 credits. Hours to be arranged.

FRENCH

I and II are devoted to the study of Chardenal's complete French Grammar, or Squair and Frazer's Grammar. Readers: Trois Contes Modernes. Rollins' French, La Tulipe Noire, L'Abbe Constantin et al. M., T., W., Th. 9:30. 4 credits.

III and IV (second year) consist of intermediate readings, Trois Mousquetaires, Quatre vingt treize and similar works. M., W., Fr. 10:30. 3 credits.

V and VI (elective) are devoted to more difficult French. Duval's Histoire de la Literature. Sight Readers: Les Miserables, Notre Dame de Paris, etc. Hours to be arranged. 3 credits.

SPANISH

A three years' course has been planned. So far only two years have been given.

I and II. Monsanto y Languiller Spanish Grammar is used, or Loiseau Grammar and Reader, followed by an easy Reader, such as El Si de las Ninas or Dona Perfecta. M., W., Fr. 2:30. 3 credits.

III and IV. Readers: Cervantes, Don Quixote and others of equal difficulty. Hours to be arranged. 3 credits.

ESPERANTO.

A class in Esperanto was organized as an Elective Course of one hour's credit per semester. Elementary Lessons in Esperanto is the text used. M. 11:30. Fr. 8:30.

DEPARTMENT OF CHEMISTRY

The courses in chemistry cover the field of pure chemistry, and are also designed for those who expect to engage in technical work.

As an introductory to all courses in this subject, a course in General Chemistry extending over two semesters is given. This is presented by recitations, lectures and laboratory work, and is required of all students in the University. It should be taken in the Freshman year. In this year's work students gain a clear conception of chemical elements, chemical changes, and the philosophy of chemistry in general—principles too often indistinctly learned, but absolutely essential for all future work in this science. The student will be expected to do a large amount of quantitative work in connection with the laboratory course.

One-half year in Qualitative Analysis follows this work. It is taught by lectures and recitations, but the larger proportion of the student's time is spent in the laboratory. It is expected that another semester will be devoted to Quantitative Analysis which involves the principles of analysis by both gravimetric and volumetric methods.

These two years of work should be considered as essential for all other work in Chemistry and for advanced work in Mineralogy.. It is recommended that Assaying be not taken up until after this amount of work has been finished, although only the first three semesters of work are required.

Advanced courses in Chemistry are taken up at the student's option. A course in Organic Chemistry involving lectures and laboratory work on the chemistry of the compounds of carbon is offered for those students fitted for the work.

The course in Physical Chemistry should be taken by all students specializing in either Physics or Chemistry. It is of great value to students of Philosophy.

There is a large demand in Montana for chemists who have a thorough mastery of their profession. The principal lines of work open to professional chemists are:

I. Teaching in colleges and secondary schools.

II. As chemists and assayers for smelters and mines.

III. Other technical work. There is a steadily increasing demand for chemists in many industries, including iron and steel works, sugar refineries, color works, print works, chemical manufactories, railroads and all large corporations. Manufacturing chemistry is a field of great profit, especially to those who introduce or develop new industries.

IV. Analytical chemistry and assaying. There is always a demand for chemists who can give their whole time to questions in

legal and technical chemistry. The most proiftable fields are: Toxicology, mining chemistry, sanitary chemistry, industrial applications and physical chemistry.

V. Government and state work. The geological surveys, the Philippine service, boards of health, agricultural experiment stations and the food inspection service employ many chemists.

COURSES IN CHEMISTRY*

1. GENERAL INORGANIC CHEMISTRY.—Non-Metals. Required of all students. Open to all students who have no entrance conditions in mathematics. Alexander Smith's Inorganic Chemistry and Laboratory Manual are used as texts. Two lectures or recitations per week. Two afternoons of laboratory work. Four hours. First semester. Lectures, 9:30-10:30. T., Th.

II. (a) GENERAL INORGANIC CHEMISTRY.—Metals. A continuation of Course I. Required of all students. Four hours. Second semester.

II. (b) SANITARY CHEMISTRY—An elementary course. Open to students who have taken Course I, or High School Chemistry. One or two hours. Second semester.

II. (b) CHEMISTRY OF FOODS.—An elementary course. Open to students who have taken Course I, or High School Chemistry. One or two hours. First semester.

III. (a) QUALITATIVE ANALYSIS.—Required of all students specializing in Chemistry, and must be preceded by Courses I and II, or their equivalent in some laboratory of acknowledged standing.
Two lectures and two or three hours of laboratory work.
Four or five hours first semester.

III. (b) ADVANCED QUALITATIVE ANALYSIS.—A continuation of Course III. Required of Mining and Chemistry students.
Four or five hours. Second semester.

IV. QUANTITATIVE ANALYSIS.—Introductory; must be preceded by Courses I, II and III (a). The principles of gravimetric and volumetric analysis are presented in this course. Required of all students specializing in Chemistry, Mineralogy and Assaying. Four afternoons of laboratory work, with explanatory lectures. Four hours. Either semester.

V. WET ASSAYING.—This course is designed for those who expect to become chemists in smelters and for those who are interested in mining work. Three afternoons. Either semester.

VI. MINERAL ANALYSIS.—Systematic. Quantitative analysis of representative minerals. Required of all students specializing in Chemistry. Four afternoons. Either semester.

VII. ORGANIC CHEMISTRY.—Lectures and recitations on the Chemistry of the compounds of carbon, including the fatty and the aromatic series. The aim of the course will be to take up very thoroughly

*All of the courses outlined have been presented during the past five years. The more advanced courses are not given every year, but Chemistry students will be given a chance to take any course desired at some period of their undergraduate work.

the simpler compounds, going with great detail into a study of the relationships and characteristic reactions of the different classes of organic compounds. Noyes' Organic Chemistry is used as a text and Richter's or Bernstein's Organic Chemistry will be used as a reference book. Must be followed by Course VIII.

Prerequisite: General Chemistry and Qualitative Analysis. Two hours. First semester in alternate years.

VIII. ORGANIC CHEMISTRY.—A continuation of Course VII. Two hours. Second semester in alternate years.

IX. ORGANIC PREPARATIONS.—Laboratory work. Open in connection with Course VII to students who have completed Course III. Two afternoons. First semester in alternate years.

X. ORGANIC PREPARATIONS.—A continuation of Course IX. Open to students who are taking Course VIII. Two afternoons. Second semester in alternate years.

XI. PHYSICAL CHEMISTRY.—Lectures, assigned readings and reports. Morgan's Physical Chemistry is used as a text. Course XI is necessary for all students who wish to acquire more than a very elementary knowledge of Chemistry. Must be preceded by Courses I, II and III, and by Courses I and II in Physics. Three hours. First semester, alternate years.

XII. PHYSICAL CHEMISTRY.—A continuation of Course XI. One lecture and two afternoons of laboratory work. Three hours. Second semester.

XIII. ELECTRO-CHEMISTRY AND ELECTRICAL MEASUREMENTS.—Required of Engineering students. Two lectures and two afternoons of laboratory work.

*XIV. (a) DRY ASSAYING.—Must be preceded by Courses I and II and, if possible, by III (a) and IV. Students specializing in Chemistry and Assaying will not be permitted to take this course unless preceded by Course II and Mineralogy and accompanied or preceded by Course III. Includes laboratory work in grinding and sampling ores, and the fire assay for gold, silver, lead and copper, and the bullion assay. Determinations involving volumetric methods, or the so-called wet methods, will be given as part of Courses IV, V or VI, depending upon the needs of the student.

Lectures on occurrences of ores, methods of sampling and fluxing for the assays of all of the principal metals will be given. Students desiring to specialize in the work should precede the course by Mineralogy. Required of students preparing for mining. One lecture and two afternoons. Three hours. Second semester.

XV. (a) FUELS AND THE METALLURGY OF IRON, STEEL AND LEAD.—Lectures, assigned reading and reports. Two lectures will be given per week, and each student will be expected to hand in a paper on some practical subject at least once a week. Three hours. First semester, alternate years.

XV. (b) THE METALLURGY OF COPPER.—Three or four hours, including laboratory work, and visits to the smelters.

XVI. INDUSTRIAL CHEMISTRY.— continuation of Course XII. Will be given only when a sufficient number of students desire to

continue the work through this semester. Acid and alkali manufacturing, sugar making and refining, petroleum, etc. Thorp's Industrial Chemistry is used as a reference book. Three hours. Second semester, alternate years.

XVII. GAS ANALYSIS.—A short course in the technical analysis of gases with Hempel's apparatus. One or two afternoons. Either semester.

XVIII. ORGANIC ANALYSIS.—Open to students who have completed Courses IV, VII, IX and X. Two afternoons. Either semester.

XIX. INORGANIC PREPARATIONS.—A laboratory course in the preparation and purification of inorganic compounds. Lengfeld's Inorganic Chemical Preparations will be used as a text. Two or four afternoons. Either semester.

XX. ADVANCED INORGANIC PREPARATIONS.—A continuation of Course XVI. Two or four afternoons. Either semester.

XXI. PHYSIOLOGICAL CHEMISTRY.—Hawk's Physiological Chemistry is used as a laboratory guide. Four hours. First semester.

XXII. PHYSIOLOGICAL CHEMISTRY.—A continuation of Course XXI.

XXIII. SANITARY WATER ANALYSIS.—Two or four afternoons. Either semester.

XXIV. PHOTOGRAPHY.—Lectures on the Chemistry of Photography for students taking this course in the Department of Biology. A camera will be provided by the instructor, and the other materials by the department, for laboratory experiments in connection with the lectures.

GRADUATE WORK.—Many of the above courses are suitable for Graduate Work. Courses VII and XXIII, inclusive, will be accepted for advanced degrees when taken with the following:

XXV. RESEARCH.—Special problems in Organic Chemistry, Analytical Chemistry, Water Analysis or Inorganic Toxicology. For Graduates or Fourth Year Students. Four to twenty hours. Both semesters.

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*Note—Any of the courses XIV to XXIV, inclusive, will be given when five students desire to take the special course.

DEPARTMENT OF PHYSICS AND GEOLOGY

COURSES IN PHYSICS

This subject is taught by both lectures and laboratory work. In the preparatory courses the students perform nearly all of the experiments after having had the subject presented and explained to them in the recitations.

For the advanced work the subject will be presented also by lectures and laboratory work. In this way the illustrative part of the subject is presented to the students by the lecturer and the quantitative part is done by the student himself. This arrange-

ment gives the greatest efficiency to the department, both for the student and the professor. The equipment in the way of apparatus is well arranged for both lecture experiments and for physical measurements, while the laboratories are equipped with the modern forms of tables, as described under Equipment.

I. COLLEGE PHYSICS.—Mechanics and Heat. Required of all students in the Engineering and Scientific courses. Must be preceded by Courses I and II Preparatory, or their equivalent, and by Mathematics I and II. Four hours credit, two lectures and two laboratory periods. First semester.

II. COLLEGE PHYSICS.—Electricity and Magnetism. A continuation of Course I, and cannot be taken independent of that course. Four hours credit. Second semester.

III. LIGHT.—Primarily a laboratory course. A few lectures will be given on the past theories of light and on manipulation of apparatus. Must be preceded by Courses I and II. Two hours credit. First or second semester.

IV. SOUND.—A careful study of the subject of sound by both lectures and laboratory work. Must be preceded by Courses I and II. First or second semester. Two hours credit.

V. HEAT.—A laboratory course. A more advanced course than that given in Course I. Must be preceded by Courses I and II. First or second semester. Two hours credit.

VI. ADVANCED EXPERIMENTAL PHYSICS.—Hours to be taken optional with the student, but not less than two hours may be taken. Must be preceded by Courses I, II, III, IV and V, and Mathematics I, II, III, IV and V. First or second semester.

VII. SPECIAL PHYSICS.—Research work or for the advanced students in Physics. Must be preceded by Physics I, II, III, IV and V, and Mathematics I, II, III, IV and V. First or second semester. The amount of credit given will depend upon the amount and character of work done.

COURSES IN GEOLOGY AND MINERALOGY.

At present this work is included in one department and all courses offered are elective. The subject treated will be general work in Mineralogy and Petrography, and in Dynamic Geology, and Physical Geography. Courses in Paleontology and Stratigraphic Geology will be given and the subjects will receive treatment as part of Dynamic Geology. This region offers unsurpassed opportunities for study of the many and varied processes and geological formations, while the State of Montana and neighboring states are noted for the large number of crystallized minerals found within their borders. As these states are distinctively mining states, all must realize the importance of a thorough knowledge of the principles of Mineralogy and Geology as applied to ores of economic importance. Special attention

is given to Economic Geology after the students have prepared themselves in the fields of these two sciences.

The subjects are taught by lectures and laboratory work. For Mineralogy and Lithology, the laboratory work is the examination of the minerals by megascopic and blow-pipe tests. For Geology the laboratory work is applied as field work and excursions to the different exposures of characteristic rocks, and to localities where important geological changes have taken place and left their trace.

I. GENERAL GEOLOGY.—Dynamical and Structural Geology. Two illustrated lectures per week. A study of the common minerals and rocks, in the laboratory. Field excursions to interesting geological points. Four hours credit. First semester.

II. HISTORICAL GEOLOGY.—A general study of the geological history of North America, especially the United States. Two illustrated lectures per week and a laboratory study of the most characteristic fossils of each geological period. Four hours credit. Second semester.

III. MINERALOGY.—A study of minerals from their crystallographic and physical properties. Chrystallography will be thoroughly reviewed before the study of minerals is taken up. Should be preceded by Chemistry I. Two lectures and two laboratory periods per week. Four hours credit. First semester.

IV. BLOW-PIPE ANALYSIS.—Mainly laboratory work. A study of the chemical, physical and crystallographic properties of minerals. Must be preceded by Course III and Chemistry I and II. Two or four hours credit. Second semester.

V. ECONOMIC GEOLOGY.—A general study of the non-metallic and metallic economic geology of the United States, and especially of Montana. Under the non-metallic products, coal, clay, gypsum, oil, gas, building stones, etc., will be taken up; and under the metallic products, the ores of gold, silver, copper, lead, zinc, etc., will be studied. Geological excursions will be taken to nearby mines and mills. Must be preceded by Courses I, II and III. Two or four hours credit. First or second semester.

VI. LITHOLOGY.—A general study of rocks from their physical and (a few) chemical properties. This course must be preceded by Courses I, II and III. Lectures and laboratory work. Two hours credit. First or second semester.

VII. INVERTEBRATE PALEONTOLOGY.—A careful study of invertebrate fossils and their places in the geological time scale. Special attention will be paid to Montana fossils. Lectures and laboratory work. Must be preceded by Course I and II. Two or four hours credit. First or second semester.

VIII. ADVANCED GEOLOGY.—A more careful study of the principles of Geology. Field and laboratory work, and a thorough review of past and recent geological literature. Must be preceded by Courses I and II. Two or four hours credit. First or second semester.

IX. PHYSIOGRAPHY.—A study of the chief physiographic features of the earth, their origin, history, etc. Illustrated lectures, laboratory and field work. This course is especially adapted for those desiring to teach physical geography in the secondary schools. Four hours credit. First semester.

X. SPECIAL WORK.—For students desiring to specialize in Geology and Mineralogy. Work to be outlined upon application.

XI. GRADUATE WORK.—The department is especially equipped for advanced students in General Geology, Economic Geology and Paleontology. The State has many unworked geological fields, and by means of the Summer Geological Expeditions much new and valuable museum material has been collected. This material includes rocks, minerals, invertebrate and vertebrate fossils, from almost all of the geological periods, together with a large collection of Cretaceous and Cenozoic leaves, and offers many problems for original investigation.

DEPARTMENT OF MATHEMATICS

All students are required to take Course I. Students in Scientific Course must take Courses I and II. Students in Engineering Course are required to take Courses I to VII, inclusive. Students electing Mathematics with a view of teaching the subject in high schools will be expected to complete at least Courses I to IV, inclusive, and Course X.

The last part of Course I and Courses II, III and IV present a continuous development of the subject matter which is generally given in distinct courses under the various names of algebra, analytic geometry, differential and integral calculus. The traditional division of mathematics into distinct subjects is disregarded and the principles of each subject are introduced as needed and the subjects developed together. By such a development the student gets a better grasp of mathematics as a whole. By the early introduction of the principles of analytic geometry and calculus these subjects are studied longer than otherwise would be possible, thus leading to greater familiarity with their methods and greater skill in their application.

COURSES IN MATHEMATICS

I. PLANE TRIGONOMETRY and an Introduction to a general course in Mathematics.

The work in Trigonometry covers the following subjects: Definitions of the trigonometric functions as ratios; their line representations; their graphical representations; proof of the principal formulas; trigonometric transformations; circular measure of angles; inverse trigonometric functions; proofs of formulas of right and oblique triangles; theory and use of logarithms; areas and solutions of right and oblique triangles. This course is fully illustrated by practical problems. Lengths and areas are found by graphic methods as well as by numerical calculation. The work in Trigonometry is followed by an elementary treatment of methods of elimination, including the principal theorems of determinants; graphical representation of func-

tions with applications to statistical and scientific data; algebraic polynomials including the geometry of the straight line and some of the more important theorems of the theory of equations. Five hours. First Semester.

II. This course is a continuation of Course I. It covers the following subjects: Definition of a derivative; simple applications of the calculus to problems including tangents, maxima and minima, etc.; general discussion of algebraic functions; simple applications of integration; elementary transcendental functions; parametric representation of curves; polar coordinates and curvature. Five hours. Second semester.

III. A continuation of Course II.

The integral, as a limit of a sum, with its applications to practical problems, etc. Five hours. First semester.

IV. A continuation of Course III.

Length of curves; center of mass; moment of inertia; approximate integrations; integral curves, etc. Three hours. Second semester.

V. ANALYTIC MECHANICS.—An exposition of the general methods of stresses with applications to the development of reactions, stresses, centrifugal forces, projectiles, pendulums, harmonic motion, moment of inertia, radius of gyration, center of percussion, angular momentum and impact. Also the application of the foregoing to practical problems of engineering accompanied by constant reference to dimensional equations. Four hours. Both semesters.

Prerequisite: Course III in Mathematics and Course I in Physics.

VI. DIFFERENTIAL EQUATIONS. — An introductory Course: Solution of ordinary and partial differential equations with application to problems in physics and engineering. Three hours. First semester.

Prerequisite: Course IV.

VII. METHOD OF LEAST SQUARES AND THE PRECISION OF MEASUREMENTS.—A discussion of the nature and methods of elimination of errors, adjustment of observations, the determination of the precision measure of results and the discussion of the accuracy necessary to be attained in the component measurements of a series in order that the final result may be secured with a prescribed degree of accuracy. Graphical methods of treating observations, empirical equations. Two hours. Second semester. Primarily for students in engineering, but open to scientific students. Prerequisite: Course III.

VIII. SPHERICAL TRIGONOMETRY.—The development of the formulas of spherical trigonometry, the solution of spherical triangles, problems in spherical mensuration. Two hours. Second semester.

IX. HISTORY OF MATHEMATICS.—Outline of the history of mathematical discovery and the development of mathematical thought. Three hours. First semester.

Prerequisite: Course IV.

X. TEACHERS' COURSE.—A critical review of Secondary Mathematics; discussion of current developments in methods of teaching and subject-matter taught; comparative study of leading text-books; correlation of mathematics with allied subjects; laboratory mathematics. Three hours. Second semester.

Prerequisite: Course IV.

XI. THEORY OF EQUATIONS.—A continuation of the theory of equations given in Courses I and II, including symmetric functions of roots, properties of derived functions, methods of elimination and transformation. Three hours. First semester.
Prerequisite: Course II.

XII. GENERAL ASTRONOMY.—An introductory study of the present state of the science of astronomy, together with an investigation of the theories and facts of observation upon which this rests. Largely descriptive, but including observation work. Three hours. First semester.
Prerequisite: Course II.

XIII. SOLID ANALYTIC GEOMETRY AND DETERMINANTS.—After developing the theory of determinants, use of the same is made in simplifying results in the solid analytic geometry. Four hours. Second semester.
Prerequisite: Course III.

XIV. ADVANCED INTEGRAL CALCULUS.—Including definite integrals, elliptic integrals, introduction to Fourier's Series with application to geometry, mechanics and physics. Four hours. First semester.
Prerequisite: Course IV.

XV. DIFFERENTIAL EQUATIONS.—A continuation of Course VI.—Emphasis being placed on partial differential equations with applications to geometry and physics. Three hours. First semester.

XVI. MODERN ANALYTIC GEOMETRY.—Trilinear coordinates, duality, harmonic and anharmonic properties, projective properties, theory of correspondence, etc. Four hours. Second semester.
Prerequisite: Course III.

XVII. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.—An introductory course.—Geometrical representation of complex quantities, conformal representation, etc. The methods of Cauchy and Riemann are followed. Four hours. Second semester.

GRADUATE COURSES

Opportunity will be given graduate students in Mathematics and Engineering and others who are prepared for the work to select from the following Courses: Fourier's Series and Spherical Harmonics, Vector Analysis, Theory of Potential, Advanced Course in Functions of a Complex Variable, Elliptic Functions.

DEPARTMENT OF BIOLOGY

The fundamental idea in carrying on the work of the department is to develop the mental faculties of the students and give them a general knowledge of the laws controlling living organism. This is done by both class room and laboratory study. The former consists of text book study, lectures and library reading and reference. The latter consists of actual and individual study of material, including the best methods of carrying on the different kinds of laboratory work.

The department has an outfit of over 25 compound microscopes, with necessary appliances, glassware, reagents and chemicals. It has a complete photographic equipment for ordinary work. Necessary charts, models and appliances for demonstration are provided. The supply of collected material in the museum is sufficient for all ordinary study. Marine specimens are supplied where such are necessary for the proper elucidation or demonstration of problems.

In all laboratory work of the department the students work individually at separate tables. Each student is supplied with microscope, glassware, and necessary apparatus, the material being kept in the drawer space of the table. The material is charged to the student and he is held accountable for it. At the close of the semester when the material is returned, in good order, he is credited with the amount returned.

COURSES OF STUDY

The following courses are offered for the year 1908-1909; for the year of required Biology the students may take Courses I and II, or V and VI.

I. GENERAL BIOLOGY.—An introduction to the study of living things. It is designed to illustrate by tne study of a few organisms the fundamental structure and properties of living matter. A series of animal and vegetable forms is studied in the laboratory to harmonize with recitations. Two lectures and five hours of laboratory per week.

This course is required of all students. First semester. Lecture at 10:30 Tuesday and Thursday, laboratory from 1:30 to 4, two afternoons per week.

II. GENERAL BIOLOGY.—Continuation of Course I, and necessary for the completion of the work therein indicated. Second semester. Four hours credit. Lecture and laboratory at same hours as Course I.

III. INVERTEBRATE ZOOLOGY.—A general course in the morphology and classification of Invertebrates. Laboratory and Class Work. Dissection of typical Invertebrates.

Lectures or recitations occur twice a week. In the latter Weysse's Zoology is taken as a basis for study. First semester. Four hours credit. Elective. Lectures or recitations at 8:30 Tuesday and Thursday. Laboratory, five hours, at times to be arranged.

IV. A CONTINUATION OF COURSE III.—Vertebrate Zoology. The dissections include Balanoglossus, Amphioxus, Trout, Frog, Cat, etc. Second semester. Elective. Lectures and laboratory at same hours as in Course III.

V. BOTANY.—In this course the plan is to give an intelligent idea of the scope of modern Botany. Recitation twice and laboratory practice five hours per week. First semester. Four hours credit. Recitations at 11:30, M. and F.

VI. SYSTEMATIC BOTANY.—To be preceded by Course V. The region near the University has a rich flora, of great botanical interest.

The Valley has an altitude of 3,225 feet above the sea, and plants may be had from this height to 9,500 feet, the height of Mt. Lo Lo some miles distant.

Laboratory and field work, with lectures or recitations. Second semester. Four hours credit. Recitations at 11:30 M. and F.

VII. ORGANIC EVOLUTION.—This course is given conjointly by the departments of Biology, Geology and Psychology, and will consist of a series of lectures accompanied by literary references for reading. Those entering the class will be expected to have had a year in Biology. Elective. First semester, T. and Th., at 11:30.

VIII. BACTERIOLOGY.—A general course will be given. The subject for discussion in the recitation room will follow that included in Newmann's and Fisher's Texts. The laboratory work will be conducted in the manner outlined in Frost's Manual. First semester. Four hours credit. T. and Th., at 9:30.

IX. THE HUMAN BODY.—An advanced subject for mature students, requiring a good foundation in Biology, Chemistry and Physics. The work given will, in a general way, be similar to the course of study outlined in Martin's Advanced Course on the Human Body. In addition the skeleton and models will be studied, and outside readings assigned. The anatomy and physiology of the supporting tissues, motor tissues, nervous system, and metabolism in general will be considered. M., T., Th. and F. 10:30. Second semester.

X. ENTOMOLOGY.—A course in the systematic entomology; a study of the anatomy and morphology of insects, followed by systematic study of the different orders, and families, with use of keys for determination of species. Comstock's Insect Life is the basis for the specific determinations. Special attention is given to injurious insects, with means employed for their control. Three or four hours credit. Second semester. Elective. T. and Th., at 8:30, laboratory at hours to be arranged.

XI. PHOTOGRAPHY.—A study of lenses, cameras, paper, developers, etc., Practical demonstration in printing, toning, developing, negative making and the various manipulations necessary to produce a completed and perfect picture. This is not an elementary study, but demands a knowledge of both physics and chemistry, which are prerequisites for admission. One lecture or recitation, laboratory Friday afternoon. If this is selected it must be for the year.

XII. PHOTOGRAPHY, CONTINUATION OF THE PRECEDING.—The student is taught how to make lantern plates, transparencies and bromide enlargements, is made to copy various subjects of different colors, is given scientific objects to photograph, and is given all the important details of general photography. No attempt is made in either this or Course XI at portraiture. One conference hour and four hours of laboratory.

XII and XIII. RESEARCH WORK.—Under this heading additional study along biological lines will be outlined for students desiring it, considering both the demands of the students and the capacity of the department for carrying on the work. Those entering this work must have finished four of the preceding courses, and must have a reading knowledge of French and German. Laboratory work, ten hours per

week for four hours credit, or twelve and one-half hours for five hours credit, with work in Seminary. One day each week will be devoted to reports on reading of current magazines, one to discussion of the work in progress. Magazine reading at 9:30 Tuesday. Seminary, 9:30 Thursday. Laboratory at hours to be arranged.

GRADUATE COURSES

Graduate students applying for work will be given every facility for study. Individual work will be outlined, considering the facilities of the department and the previous work of the applicant. Problems in variation, ecology and histology are readily found, and candidates will be encouraged to pursue studies for which they are fitted and for which they have preference.

BIOLOGICAL STATION

In addition to the courses here offered students are referred to the description of the work of the Biological Station, carried on under the direction of the Professor of Biology. The courses of summer work are open to all who may choose to attend, and credit on the University record is given for the amount of work satisfactorily completed during the summer.

DEPARTMENT OF FREE HAND DRAWING

GENERAL STATEMENT

The aim of this department is (1) to give thorough instruction in drawing and painting, to teach as far as possible the technique of this work; (2) to inculcate by similar effort an appreciation of the difficulties and purposes of the great masters; and (3) to broaden the student's comprehension of ideal and spiritual beauty, a side of his nature usually neglected.

The arrangement of the courses follows the general trend of the best art schools. Care is taken that the work does not become narrow and mechanical, the desire being to foster orignality, and breadth of understanding and of execution. As much freedom in the exercise of individual taste is allowed as is consistent with thorough work. It is expected, however that all who undertake the courses offered will wish to study progressively and systematically.

The collegiate courses are free electives and the student may take two and one-half to five hours per week, credit being given according to the time spent.

In addition two courses of a more general character are offered. The work of these courses will be found profitable to all desiring a short general course, but they are intended primarily for students expecting to teach, and the latest standards of practical work, supplemented by lectures, and discussions of principles will form the essential features. The first course

outlines the chief points, the second is supplementary to the first, and gives an opportunity for more thorough training. Each course counts two credits.

Three courses are given in the History of Art; the History of Architecture, the History of Sculpture, and the History of Painting. The library method is followed, the University Library being well supplied with the standard reference books in Art. The work consists of recitations and lectures illustrated by an excellent collection of photographs and the sciopticon. The study of the History of Art is conducive to culture and refinement, and some course in it should be taken by all students. It gives an understanding of the emotional and spiritual life of man.

COURSES IN DRAWING AND PAINTING

I. BLACK AND WHITE WORK.—Elective. 2.
- a. Drawing in charcoal from full legnth cast.
- b. Drawing in pen and ink and wash from still life.
- c. Composition. Decorative and pictorial.

II. BLACK AND WHITE WORK.—Elective. 2.
- a Drawing in charcoal from full length cast.
- b. Sketching from the draped model.
- c. Outdoor sketching.
- d. Memory sketching.

III. BLACK AND WHITE WORK.—Elective. 2.
- a. Drawing in charcoal from draped model.
- b. Quick sketching from model and interiors.
- c. Newspaper illustration.
- d. Perspective.

IV. BLACK AND WHITE WORK.—Elective. 2.
- a. Work from draped model and interior in any medium.
- b. Drawing from landscape and street scenes.
- c. Group composition.
- d. Magazine illustration.

V. WATER COLOR PAINTING.—Elective. 2.
- a. Painting from still life.
- b. Painting from fruit.

VI. WATER COLOR PAINTING.—Elective. 2.
- a. Painting from flowers and still life.
- b. Outdoor sketching.
- c. Composition.

VII. WATER COLOR PAINTING.—Elective. 2.
- a. Drawing in charcoal from full length cast.
- b. Painting from draped model.
- c. Painting from landscape.

VIII. WATER COLOR PAINTING.—Elective. 2.
- a. Drawing in charcoal from human head.
- b. Painting from human head.
- c. Painting from landscape.
- d. Painting from draped model and interiors.

IX. OIL PAINTING.—Elective. 2.
  a. Painting from still life.
  b. Painting from fruit.

X. OIL PAINTING.—Elective. 2.
  a. Painting of flowers and still life.
  b. Sketching and painting from landscape.
  c. Composition.

XI. OIL PAINTING.—Elective. 2.
  a. Drawing in charcoal from full length cast.
  b. Painting from draped model.
  c. Painting from landscape.

XII. OIL PAINTING.—Elective. 2.
  a. Drawing in charcoal from human head.
  b. Painting from the human.
  c. Painting from landscape.
  d. Painting from model and interiors.

XIII. DESIGN.—Elective. 2.
  a. Principles of design.
  b. Lettering
  c. Patterns.
  d. Book covers.

XIV. APPLIED DESIGN.—Elective. 2.
  a. Principles of design.
  b. Designing in clay.
  c. Designing in leather.
  d. Designing in metal.

XV. TEACHERS' DRAWING—Elective. 2.
  a. Lectures on principles.
  b. Drawing from still life in various mediums.
  c. Sketching from fruit, flowers, landscape, model.
  d. Design with applications in clay, metal and leather.
  e. Water Color Painting. Color Theory.

XVI. TEACHERS' DRAWING.—Elective. 2.
  a. Lectures on principles.
  b. Course XV more thoroughly developed.

COURSES IN THE HISTORY OF ART

I. HISTORY OF PAINTING.—Elective. 2.
II. HISTORY OF ARCHITECTURE.—Elective. 2.
III. HISTORY OF SCULPTURE.—Elective. 2.

SCHOOL OF ENGINEERING

In proportion to the number of inhabitants, there is more demand for young men in the various branches of engineering in Montana than in any other State of the Union. The thousands of horsepowers of the streams are being developed as fast as capital can be raised for the purpose; interurban roads are being projected; mills and factories are being erected; and new

mines are being opened. All of these enterprises call for technically trained young men, and for many more each year than all the schools of the State together can furnish.

The demands made upon the engineer in Montana call, of necessity, for training in a great variety of lines. The policy of the School of Engineering, accordingly, is to give him a broad general training in the main principles underlying the practice of Civil, Electrical and Mechanical Engineering. Thus equipped, he can take up specialized work after graduation, with the expectation of carrying it on successfully.

Courses in the class room, drawing room, laboratories and shops are given to enable the student to base all of his work upon sound principles; to give practice in such work and calculations as the engineer, in pursuit of his profession, is called upon to perform; to teach him to make original investigations; and to familiarize him with the theoretical and practical parts of his profession.

The practical work runs parallel with the theoretical, the department being well equipped with instruments and apparatus for making tests and engineering investigations. The shop exercises, which are required of every engineering student, are to familiarize him with the typical operations involved in the arts, and to give him practical instruction in the nature of the materials of construction. The instruction in drawing is of such character as to prepare the student for his professional work in future on both theoretical and practical lines.

The School occupies quarters in Science Hall. On the first floor, at the front of the building, is the office of the Professor in charge with a drawing room adjoining; at the rear in the extension of the main building are the wood shop, machine shop, forge shop and foundry; in the basement are the boiler room and laboratory and engine room; and on the top floor of the main part of the building is located another drawing room.

The drawing room on the first floor is 23x34 feet in size. A part of it is used by the Professor of Engineering for classes, while the other part furnishes a drawing and reading room for students in the upper classes. It is well equipped with drawing tables and drawing boards. A library of over 300 volumes of standard works on engineering and allied subjects furnishes the student with valuable references.

The wood shop is 30x40 feet in size, and is well lighted on opposite sides. There are ten places for bench work furnished with benches and vices and tool-cupboards, well stocked with all the necessary tools. Ten lathes of 11-inch swing enable an equal number of students to engage in wood turning. There is also a large wood-turning lathe of 16-inch swing and 12-foot bed, with double-ended spindle, for large work. A double circular sawing

table, with cross-cutting and rip-saws, a wood-trimmer and a grindstone complete the equipment of the shop.

Adjacent to the wood shop is the machine shop. It is 30x 27½ feet in size and is well lighted from opposite sides. Its equipment consists of a 16-inch swing engine lathe, complete with taper and screw-cutting attachments, and fully equipped with chucks, face-plates and the necessary tools; also a 32-inch swing drill press, a small drill press, a 16-inch shaper, a power hack-saw, a wet-emery grinder, a double emery grinder, and four benches complete with vices for chipping and filing. At one side of the shop, space is partitioned off for a tool room, in which all the tools for general use in the shop are kept. A checking system, similar to that employed in many modern shops, is used, and forms a valuable part of the shop instruction.

Adjacent to the machine shop is the forge shop, 30x30 feet in size. Eight Buffalo down-draft forges served by a Buffalo combination blower and exhaust system, a small portable forge, a combination shearing and punching machine, together with a complete outfit of anvils, hammers, tongs and all the other tools necessary for forging, constitute the equipment of this part of the shops. This shop is well lighted by windows on two sides of the room.

Opening off the machine and forge shops is the foundry. It is 30x30 feet in size and well lighted by windows on two sides of the room. Its equipment consists of a No. 0. Whiting Cupola, a Sturtevant pressure blower, a core oven, a core-making vice and all the tools and apparatus necessary for foundry work.

In the basement a 50-horsepower automatic Atlas engine furnishes power for the shops and laboratory apparatus. It is equipped with a Prony brake and the necessary rigging for taking indicator cards, and is also used for testing purposes. Three 70-horsepower multitubular boilers, which furnish steam for heating and power, are available for tests. In the boiler room there is a steam pump and the power equipment of the University Paul-system steam-heating plant, also available for testing purposes.

At the top of the building, a drawing room 30x40 feet in size, and well lighted from the roof, furnishes accommodations for classes in the first and second years.

For experimental purposes, there are available, in addition to the boilers, engine, etc., already referred to, a 125-light 6,300-volt Brush arc-light generator, a Westinghouse rotary converter, and induction motor, a 15-kilowat direct-current generator, an interpole variable speed direct-current motor, transformers, storage batteries, etc., and all the instruments necessary for making electrical tests. There are calorimeters, indicator rigs, flow-of-

steam apparatus, and the necessary equipment for making ordinary steam-engineering tests. The laboratory equipment is added to every year in order to keep it up to date.

For field work in surveying the department is well equipped with an excellent surveying outfit, consisting of transits, Y levels, compass, solar attachments, leveling rods, chains, tapes, etc.

DRAWING

The drawing courses are arranged with a view to preparing the student for his future professional work. In order to accomplish this, it is necessary to develop his taste as well as his judgment, together with speed and precision. Great stress is laid upon the arrangement of the various parts of the drawing and upon neatness and correctness of form for letters and figures, in order that a finished drawing may present the appearance of a harmonious whole.

I. MECHANICAL DRAWING.—Drawing instruments and their uses; geometrical construction; drawing from objects, and orthographic projections; lettering and dimensioning; and line shading, all according to working methods.

In the second semester, drawings are made of simple machine parts and of the machines themselves.

Five hours throughout the year. Two credits each half year. Prescribed the first year.

IIA. DESCRIPTIVE GEOMETRY.—Representation of the point, line and solid; sections and intersections of solids; isometric projections.

Five hours the first half year. Two credits. Prescribed the second year.

IIB. DESCRIPTIVE GEOMETRY.—A continuation of the work of the first semester; shadows and shade lines; perspective drawing.

Five hours the second half year. Two credits. Prescribed the second year. Prerequisite: Course IIA.

III. ENGINEERING DRAWING.—This course is based on the theoretical work in Mechanism, and consists of problems in belting, the design of cams, quick-return motions, and various other problems relating to Mechanism. The student is taught the blue print process.

Five hours the first half year. Two credits. Prescribed the third year. Prerequisite, Course IIA.

IV. GRAPHIC STATICS.—The general theory of Graphic Statics with applications, including the graphical analysis of the stresses in structures, such as in roof-trusses and bridges. Lectures and drawing exercises.

Five hours the first half year. Two credits. Prerequisite, Course II.

V. MACHINE DESIGN.—The application of the principles already mastered to the solution of problems in design. Each student makes a complete design, such as a boiler, a fly wheel, a shaft-coupling, or some other similar piece of apparatus. The constructive details of the design in question are first fully discussed by means of lectures, after which the student makes the necessary calculations to determine the

proper dimensions of each part by means of principles (not empirical formulas), after which he makes a complete set of working drawings.

Five hours the first half year. Two credits. Prescribed the fourth year. Prerequisites, Analytical Mechanics and Strength of Materials.

VI. MECHANICAL AND ELECTRICAL MACHINE DESIGN.—This is a continuation of Course V and consists of the application of mechanical and electrical principles already acquired to the design of an electrical machine, such as a generator or motor. The student, after having the details of the design discussed in the lecture room, makes a complete set of calculations for both the mechanical and electrical features of the machine, after which he makes a full set of working drawings, a set of tracing and blue prints.

Five hours the second half year. Two credits. Prerequisites, Theoretical Electricity in addition to those for Course V.

SHOP WORK

The object of the shop exercises is to familiarize the student with the typical operations involved in the arts, and to give him practical instruction in the nature of the materials of construction.

CARPENTERY, WOOD TURNING AND PATTERN MAKING.—This includes instruction in sawing, planing, chiseling, chamfering, grooving, plain moulding work, framing, tenoning, splicing, mortising and fitting, use of the mitre-box, nailing, dovetailing, gluing and the use of sandpaper.

Systematic instruction is given in the use of the wood lathe, including center and chuck turning, the proper use of the various turning tools and general good practice in wood turning.

Instruction in the method of building up patterns and coreboxes, the reason for "draft" and a general exposition of good practice in pattern making.

FORGING.—Instruction in the proper manner in which fires should be built and cared for, heating, drawing, forming, bending and twisting wrought iron. Upsetting, making square corners, punching, bolt making, chamfering, welding, making and the use of heading tools, chain making, braces, hooks, ring bolts, riveting, the use of threading tools and instruction in general good practice in forging. Steel work, including drawing, forming, welding, tempering, and tool and spring making.

CHIPPING, FILING AND MACHINE-TOOL WORK.—The exercises include work in chipping chamfers, flat concave and convex surfaces, Keyways, and chipping to shoulder. Filing includes exercises in cross filing, draw filing, free-hand filing, hack-sawing, drive and sliding fits, finishing and polishing. The machine-tool work consists in the various operations that are feasible with the ordinary machine-tools, such as centering, squaring, straight and taper turning, screw cutting, chucking, reaming, finishing and polishing, drilling, tapping, boring, gear cutting and instruction in pipe fittng.

FOUNDRY.—Instruction in tempering sand and making moulds for small work, exercises in core-making, and a general exposition of good practice. Visits are made to foundries in the neighborhood in order to give the student a chance to see large work in process of manufacture.

Three afternoons throughout the year. Three credits per half year. Required the first year.

CIVIL, ELECTRICAL AND MECHANICAL ENGINEERING

I. ANALYTICAL MECHANICS.—An exposition of the general methods of Statics, with applications to the determination of reactions, stresses, center of gravity, etc. The equations of various forms of motion, moment of inertia, radius of gyration and center of percussion, angular momentum and impact. Also, the application of the principles of the foregoing to practical problems of Engineering, with constant reference to dimensional equations.

Four hours throughout the year. Four credits per half year. Prescribed the third year. Prerequisites, Calculus IV and Physics I and II.

II. HYDRAULICS.—The principles of hydrostatic and hydrodynamic pressure, the flow of water through orifices and nozzles, over weirs and dams, through pipes, sewers and conduits, and in open channels; the various losses from friction and other sources. Numerous problems illustrative of the principles are solved and the student is made familiar with the latest and best results of experimental work.

Three hours the first half year. Three credits. Prescribed the fourth year. Prerequisite, Course I.

III. HYDRAULICS AND HYDRAULIC MOTORS.—A continuation of Course II. A study of impulse and reaction turbines, their construction, regulation, installation and testing, and the losses that occur in their operation.

Three hours the second half year. Three credits. Required the fourth year. Prerequisite: Course II.

IVA. THERMODYNAMICS.—The principles of Thermodynamics mathematically treated, the properties of gases and vapors, especially steam; the flow of steam and other fluids; the injector, hot air and gas engines; the theory of the steam turbine. The theoretical part of the subject is followed by a study of the steam engine in its various forms, of the compound and multiple expansion engine, of compressed air and hot air engines. Methods of making engine tests are explained and discussed, together with such results of reliable tests as are available. A study is made of the various accessories of a steam plant, such as pumps, condensers, feed-water heaters, etc. Following this, a study of the main features of a modern steam plant is made with reference to design.

Three hours the first half year. Three credits. Prescribed the fourth year. Prerequisites, Physics I and II, Calculus VII and Course I.

IVB. STEAM ENGINEERING—A continuation of Course IVA. A study of good steam engineering practice with reference to power plants, also a study of good practice in regard to gas and oil power plants.

Two hours the second half year. Two credits. Prescribed the fourth year. Prerequisites, Course IV-A.

V-A. MECHANISM AND GEAR TEETH.—A study of the important mechanisms found in ordinary machines, and the methods of supporting and guiding the parts, but without reference to their strength; also the theory and practice of designing various mechanisms and their application to machines. Also a study of the theory and practice of gear tooth design.

Three hours the first half year. Three credits. Prescribed the third year. Taken simultaneously with Course I.

V-B. VALVE GEARS.—The theory and practice of valve gears for engines, with special reference to their design. Includes plain slide valves, link motions, double valves, radical valve gears, and drop cut-off valves.

Three hours the second half year. Three credits. Prescribed the third year. Prerequisite, Course V-A.

VI-A. SURVEYING.—The theory and practice of Surveying, including the use of the tape, chain, compass, solar compass, transit and the various forms of leveling instruments. Contour maps, profiles and scale drawings are made from notes taken in the field, and the computations which arise in the work of the surveyor are made in the drawing room; also a study of the application of contour maps to the solution of problems of drainage, landscape engineering, etc. Sectioning and forest-boundary surveys, topographic, land, city and hydrographic surveys; also underground surveying and its application to mining work.

Three hours throughout the year. Three credits per half year. Prescribed the second year.

VI-B. FIELD WORK AND TOPOGRAPHY, TOPOGRAPHICAL DRAWING.—Field work involving the application of the principles of Surveying to practice. Topographic surveys and the making of topographic maps; maps from surveys made with the camera. The use of the slide rule for computations.

Three hours throughout the year. Three credits each half year. Prescribed the second year.

VII. STRENGTH OF MATERIALS.—A study of the data obtained by means of experiments upon full-sized pieces under practical conditions, with applications to design. Tensile, compressive and transverse tests of Cast Iron. Effect of temperature and repeated stresses upon Wrought Iron and Steel. Tests of full-sized bridge columns; riveted joints; twisting and bending tests of shafting; tests of full-sized timber beams; timber framing joints; shearing and compression across the grain in case of Timber; strength of Concrete and concrete beams and columns; reinforced Concrete; belts and ropes. Also a study of the moduli of elasticity of various materials of engineering as determined by experiment.

Three hours the second half year. Three credits. Prescribed the third year. Prerequisites, Analytical Mechanics I.

VIII. ENGINEERING LABORATORY.—A series of two-hour exercises devoted to drill in engine and pump tests, calorimetry, flow of water and steam, and the various tests that an engineer, in the practice of his profession, is called upon to perform. After the completion of the tests relating more especially to Civil and Mechanical Engineering work, an extended course of electrical tests is given, covering the more important measurements that an Electrical Engineer is expected to make. This includes power and efficiency tests of generators and motors, transformer tests, photometric measurements, instrument calibrations, and a number of practical shop tests.

Four hours throughout the year. Two credits per half year. Prescribed the fourth year. Taken simultaneously with Courses IV and X.

IX-A and B. THEORETICAL ELECTRICITY AND MEASURING

INSTRUMENTS.—The theory of electrical phenomena with special reference to its application to engineering practice. A discussion of the various instruments and methods used in measuring electrical quantities. The latter part of the course is devoted to a study of direct-current machines and installations. A study of the theory and practice of storage batteries is also included in the course.

Four hours the first half year and two hours the second half. A total of six credits. Prescribed the third year. Prerequisite, Mathematics IV and V.

X. THEORETICAL ELECTRICITY.—A discussion of the theory of alternating currents, with special reference to its application to electrical machinery, power plants and transmission lines. During the latter part of the course, the economics of electrical installations are considered and also the more general applications of electricity to practice. The student is required to become familiar with the Underwriters' rules and regulations.

Four hours throughout the year. Four credits per half year. Prescribed the fourth year. Prerequisites, Courses I and II in Physics and Courses IX-A and B.

XI. INDUSTRIAL MANAGEMENT.—A study and discussion of the organization and relation of the departments of an industrial establishment, the handling of accounts, methods of superintendence, compensating labor, the determination of the costs of production, etc.
One hour the second half year. One credit. Required the fourth year.

XII. THESIS.—The student must prepare a dissertation upon some subject included in his course of study; an original report upon some machine, work of engineering or industrial work; or an original design or investigation, accompanied by an explanatory memoir. It must be approved by the Professor in charge. Theses are to be written on standard sized paper, and must be handed in not later than the last day upon which recitations occur.

All theses and work performed in preparation of them are the property of the University, and can not be published wholly or in part except by authorization of the head of the School of Engineering. This rule applies to theses prepared by candidates for advanced degrees.
Four hours the second half year. Two credits. Required the fourth year.

OPTIONS

XIII. MILL ENGINEERING.—A study of good mill practice, including the construction and stability of mill buildings, chimney design and construction, the calculation of the stresses in an existing mill building from working drawing, the economical arrangement and methods of driving machinery; the different methods of distributing power; the design of a power plant, and the determination of the cost of power. All of the foregoing lead to the solution of the problem of the design of a complete mill plant or of a manufacturing establishment.

Three hours throughout the year. Three credits per half year.

XIV. TELEPHONY.—A discussion of the theory and operation of the apparatus used in telephone work; a study of the design and construction of aerial and underground transmission lines, central

stations, traffic problems, and the economics of telephone engineering.
Three hours throughout the year. Three credits per half year.

XV. DYNAMO DESIGN.—A discussion of the principles involved in dynamo design, with a number of applications to practical problems. This is intended for those who intend to specialize in electrical design.
Three hours throughout the year. Three credits per half year.

XVI. HEATING AND VENTILATION.—A study of the applications of the principles of the subject to problems occuring in practice. The different methods in common use are discussed and applied to illustrative problems. The student works out the complete design for the heating and ventilation of a large building.
Three hours throughout the year. Three credits per half year.

POST GRADUATE MECHANICAL AND ELECTRICAL ENGINEERING

XVII. APPLIED MECHANICS.—A continuation of the undergraduate course in Applied Mechanics. Includes the mathematical treatment of the continuous girder; a graphical treatment of the stone arch; a mathematical treatment of the elastic arch; the theory of elasticity and the determination of resultant strains in any direction; the determination of stresses on any plane in simple and compound stress; the relation between stresses and strains, with a consideration of the Poisson ratio; the determination of the principle stresses with applications to shafting subjected to combined twisting and bending; flat plates, earth-work, hydraulic presses, etc. As much as is covered by Lanza's Applied Mechanics supplemented by lectures.
Four hours throughout the year. Four credits each half year.

XVIII. ELECTRICAL AND MECHANICAL MACHINE DESIGN.—A continuation of Machine Design, V, including further applications of the principles of design to machines, generators and motors, both alternating and direct current, to transformers, and finally to station design.
Six hours throughout the year for two years. Six credits each half year.

XIX. THEORETICAL ELECTRICITY.—A mathematical discussion of the principles of electricity. As much as is contained in Steinmetz's work on Theoretical Electricity supplemented by lectures.
Four hours throughout the year. Four credits per half year.

XX. ELECTRICAL ENGINEERING.—A study of the principles involved and the methods used in the design and construction of transmission and distribution systems, also the engineering features of the application of apparatus and machinery to lighting and power plants.
Four hours throughout the year. Four credits each half year.

XXI. ELECTRIC RAILWAY ENGINEERING.—A discussion of the construction, equipment and operation of the various types of electric railways throughout the two years. Four credits per half year.

XXII. STEAM TURBINE ENGINEERING.—A study of the theory and practice of steam turbines with their application to power plants.
Four hours the first half year. Four credits.

XXIII. HYDRO-ELECTRIC POWER PLANTS.—A discussion of the principles underlying the design, construction and operation of hydro-electric power plants with application to practice. A detailed

study of existing plants is made with a view of obtaining correct ideas for designs.

Four hours the second half year. Four credits.

XXIV. INDUSTRIAL MANAGEMENT.—A continuation of the undergraduate course in Industrial Management.

Two hours throughout the year. Two credits each half year.

POST GRADUATE CIVIL ENGINEERING

XXV. HYDRAULIC MEASUREMENTS.—A continuation of the undergraduate course in Hydraulics, with special reference to measurements of flowing water such as the Civil Engineer is called upon to perform. A part of the time is spent in the field in active measurements with tubes and current meters.

Two hours the first half year. Two credits.

XXVI. SEWERS AND WATER WORKS.—A study of the principles underlying theory and practice in the design of sewers and water works with a detailed study of examples of good practice

Three hours the first term and two hours the second. Five credits in all.

XXVII. RETAINING WALLS AND DAMS.—This course is to train the student in the application of the principles of Mechanices to the design of retaining walls, dams and similar structures. Baker's Masonry Construction is used as a text book; this is supplemented by lectures. A study is made of existing examples of good practice.

XXVIII. ADVANCED SURVEYING.—This is a continuation of the undergraduate course in Surveying. It includes instruction in the use of the plane table and stadia in topographic surveys, of the sextant in hydrographic and astronomical work, of the barometer for the determination of differences in elevation: also, the construction of stadia diagrams and further instruction in the making of topographic maps.

Four hours the first half year. Four credits.

XXIX. MUNICIPAL ENGINEERING.—A discussion of the various problems that arise in the work of the Civil Engineer engaged in city work, including a study of the organization of city departments. Existing cases are treated in detail with a view of thoroughly preparing the student to take up this class of work.

Two hours throughout the year. Two credits each half year.

XXX. RAILROAD ENGINEERING.—A study of the principles and practice of Railroad Engineering and related problems, with special reference to location and design.

Three hours the last of the first year and throughout the second year. Three credits per half year.

XXXI. STEEL FRAME BUILDING.—The application of the principles of Applied Mechanics to the design of steel frame buildings, together with a study of examples of good practice in both design and construction.

Two hours throughout the year. Two credits each half year.

XXXII. BRIDGE ENGINEERING.—A study of the application of the principles of Applied Mechanics to the design of bridges, with a consideration of special problems. A detailed study of existing examples of good practice is made.

Two hours the first half year. Two credits.

XXXIII. THESIS.—A thesis similar to that required for the Bachelor's degree must be prepared by each candidate for an advanced degree. However, research work of a higher order of excellence than is required of undergraduates is expected.

Three hours throughout the first year and four hours thoughout the second. Fourteen credits in all.

XVIII-A. DESIGN.—A similar course in Design to XVIII, but shorter, and specially arranged to suit the requirements of Civil Engineers.

Four hours throughout the year. Four credits per half year.

DEPARTMENT OF MUSIC

The Department of Music in the University of Montana offers instruction in vocal and instrumental music, and opportunities for study in chorus work.

A course in Elementary Harmony and lectures on the History of Music, and celebrated composers and their works represent the scientific and cultural branches of the subject.

There is a Glee Club, at present under the direction of J. Franklin Thomas, which is a most popular organization, and which is doing excellent work in music of good grade.

The College Orchestra, under the direction of Mrs. Blanche Whitaker, has attained a high degree of excellence, and plays either classical or popular music with attack, vim and expression not often met with in organizations of its class. The esprit de corps is fine, and prospective students who know a little of some orchestral instrument are assured of careful training and opportunity for advancement.

A principal feature of the department is the Piano School, which has always maintained a very high standard, and which has produced many excellent pianists. The work of the department is at present very satisfactory. The Junior or Preparatory Course consists of elementary technical work by Landow, Aloys, Schmidt and others, and interpretative work by Bertini, Czerny, Heller, Reinecke, Gurlitt and others, all scales in octavo position, and all arpeggio of the common chord. The more advanced students take the arpeggio of the Dominant and Diminished Sevenths and more difficult interpretative work. The Senior or Upper School study scales in Thirds, Tenths and Sixths, Cramer's Studies, Clementi's Gradus ad Parnassum; and, when sufficiently advanced, studies by Moscheles, Henselt and Chopin, and interpretative work on concertos, sonatas, etc., by any of the great masters.

The Violin Department will be under the direction of Miss Hope Whitaker, who received her musical training from Mr. Henry Diamond (a Sevcik pupil), Mr. Olheiser and Mr. Emile

Sauret. The Sevcik Method will be used, also studies by Kreutzer, Spohr, etc. Miss Whitaker will also teach Advanced Harmony, Counterpoint and Composition wherever desired.

Recitals are given by the department at least three times a year, and it also furnishes music for the various College functions, the Interscholastic Meet, etc.

By resolution of the Faculty, March 31, 1908, eight credits will be allowed for Music, which is now a free elective. No credits will be allowed for any preparatory work. In Piano Technic everything is preparatory up to and including Czerny's Velocity Studies and Heller's op. 47, or their equivalents, and in Violin Hermann's and Dancha's Studies.

A gold medal is presented yearly by Mrs. E. L. Bonner for advanced technique, and other medals are awarded by the Director.

Fees—Piano, one lesson a week..............$20 the Semester
Violin, one lesson a week..............$20 the Semester
If paid monthly.....................$5.00 the month

DEPARTMENT OF PHYSICAL CULTURE

EXERCISES FOR MEN

The Department of Physical Training has jurisdiction over all gymnastic and athletic activities. It is the aim of the department to give the students such exercises, games, and sports as will best create and maintain a vigorous physical health. It endeavors to reach a large number of students, especially the weak and undeveloped, and to give all exercise that will be not only beneficial but interesting. Physical training is required of all preparatory and first and second year college students on two of each week throughout the year. One-half hour credit is given for each semester for this work.

The Gymnasium includes the usual apparatus and developing machines, such as parallel bars, vaulting bars, horizontal bar, buck, rings, trapeze, horizontal ladder, chest weights, rowing machines, wrestling mat, etc. Each student is provided with a locker. Shower baths afford accommodation for all students.

A quarter-mile cinder path and the athletic field are considered among the best in the Northwest.

EXERCISES FOR WOMEN

The work in this department is made as practical as possible. The aim is to make the Gymnasium practices progressive and systematic. General development of the body, a correct carriage, ease and grace of movement, and a correct method of breathing are the objects in view.

Two hours per week in the Gymnasium are required of all

young women in the Preparatory school and for two years in the College. Preparatory Gymnasium, Tuesday and Thursday at 11:30. Collegiate Gymnasium at 2:30.

BIOLOGICAL STATION

OSCAR J. CRAIG, M. A., Ph. D.,
President.

MORTON J. ELROD, M. A., Ph. D.,
General Zoology, Plankton Methods.

P. M. SILLOWAY,
Principal Fergus County High School, Lewistown, Bird Study (1907).

MAURICE RICKER, M. A., M. S.,
Principal West Des Moines High School, Photography, Nature Study (1907).

MRS. EDITH BROWN RICKER,
Artist (1907).

MARCUS E. JONES, M. A.,
Salt Lake City, Botany (1908).

CHARLES C. ADAMS, M. A., Ph. D.,
University of Chicago, Entomology, Distribution (1908).

The work of the Station this year will begin Wednesday, July 15, and continue four weeks, or until Thursday, August 13. The plan of the work will be as follows:

An effort will be made to make a fairly complete study of Flathead Lake. During several seasons past collections have been made and examined, and much preliminary study has been completed. Soundings have been made at various places, the animal and vegetable life has had considerable attention given to it, and the topography has been given. It is the intention to spend the summer at various points on the lake. Several camps will be made at different places, and about a week will be spent at each camp. There will be no special courses offered. Persons desiring to join the Station workers and carry on some line of study will have exceptional opportunity. Especially will there be good facilities for making collections, either for study or for school use.

The University of Montana Biological Station has 160 acres of land, given by act of Congress. This is in three tracts in separate places. At Yellow Bay, on the east side, 80 acres were selected; 40 acres were taken on Wild Horse Island and 40 on Bull Island. Camps will be made at each of these places during the summer.

Persons desiring to join in this summer camp and study

should make early application to the Director, so the necessary arrangements can be made. An invitation is extended to any interested person to join the party.

The Station is located on the bank of Swan River at its outlet into Flathead Lake. It was established in the spring of 1899.

The laboratory is a one-story frame structure, 18x24, containing a small store room, a dark room, and tables for twelve students. It is substantially built, well lighted, and well suited to outdoor work.

The Station is in possession of three boats for use in the work: A gasoline launch, "Missoula," a row boat, "Culex," and a canvas boat, "Daphnia." These boats enable the Station force and those attending to get around very nicely. In addition to the above the Station is in possession of numerous smaller pieces of material, a pump after plans of Ricker, plankton net after plans of Kofoid, insect nets, dredges, camp material, and other necessary appliances are supplied for the work. Microscopes, chemicals, glassware, and books are taken annually from the University for use at the Station.

PURPOSES OF THE STATION.

To serve as a field for research work in Botany, Zoology and Geology. To offer research work to candidates for a degree, such work being accepted by the University of Montana. To furnish a géneral course to college students, or to students where they may be permitted to work under the most favorable opportunities. To afford opportunity to teachers to collect material for class use and for their own laboratories. To provide lectures, field excursions, and laboratory exercises so as to give the best insight into the proper method of nature study. To see some of the grandest scenery in the world, and to receive the inspiration felt by those who see grand panoramas. To offer a place where healthful recreation may be had, free from care, under inspiring conditions, accompanied by an environment stimulating observation and investigation. To offer a place where kindred spirits in the state may meet and exchange ideas and by this friendly meeting receive added stimulus and enthusiasm for work.

The University of Montana Biological Station was opened in 1899. For the past nine summers the station has been occupied from June until September or October. During this time some fifteen states have been represented. The Station has bcome well known to many American naturalists, and all are enthusiastic in their praise of opportunities afforded in the vicinity of Montana's large inland lake.

For scenery the vicinity cannot be surpassed. Few places offer more varied points of interest. The roaring rapids of Swan river are at the door of the building. Flathead Lake, covering more than 300 square miles of territory, with its beautiful islands and precipitous shores, has great attractions. The Mission range, beginning on the burnt hills by the laboratory, and rising higher and higher as they extend southward, culminate in snow-capped peaks 10,000 feet in height. A few miles to the east is the Swan range, its high summits constantly in view. These two mountain ranges afford some of the most beautiful panoramas to be seen in the Rocky Mountains, and rival the Alps in magnificent scenery. Farther to the east, reached in a short time by pack train, the main chain of the Rocky Mountains breaks the horizon with lofty peaks and precipitous summits. Untrod summits invite the courageous naturalist who seeks the unknown animal and vegetable life. West of Flathead Lake are the almost unexplored Cabinets. Within a few miles are many lakes, Swan, Echo, Rost, and others, while many ponds and swamps are in the immediate vicinity. The waters of Swan and Flathead Rivers supply Flathead Lake, the former at the laboratory door, the latter but two miles distant. East and south of the Laboratory the forests extend unbroken for a hundred miles, with here and there a settler's cabin. Such a combination of lakes, rivers, mountains, forests, at elevations from 3,000 to 10,000 feet, one will find in few places in America.

The present site of the Station was chosen because of the advantages mentioned above. The seaside will always have its attractions and devotees. But there are those who love the mountains, who delight in craggy heights, and who find abundance of material for study because it is new and the field unexplored. There are many who cannot take long trips to the seashore, others who wish to spend a summer on the inland lakes in the primeval forest and among the snowclad hills. Then there is the home field. Montana needs a wider dissemination of knowledge of outdoor study. Here may be had healthful recreation, beautiful surroundings, congenial associates, and rare opportunities for observation and study.

The climate is delightful. Rarely does it rain in July and August. In the shade it is always pleasant. Long trips may be planned without danger from the elements. One may sleep out without fear. In a day from the laboratory one may reach huge snowbanks in middle August. There is an abundance of sunshine, no fogs nor dreary days and few days of excessive heat.

The postoffice is Bigfork. This village has daily mail, tele-

phone, electric light, several stores, a hotel, two restaurants, and many dwellings. It is 17 miles from Kalispell. It is easy of access by boat or the mail stage from Kalispell, and from the Northern Pacific (at Ravalli) by stage and boat.

There are no expenses in connection with the work the Station is doing, other than living expenses and a share of expense of trips. There are no fees or tuition.

Persons desiring to use the Station material before or after the time mentioned above may have the privilege of doing so. Usually there is some one at work from June until September. All inquiries should be addressed to the Director, Morton J. Elrod, Missoula, Mont.

COLLEGIATE COURSES OF STUDY

The University offers the following general courses of instruction:

A.—A classical course, leading to the degree of A. B.
B.—A course in letters, leading to the degree of A. B.
C.—A Scientific course, leading to the degree of B. S.
D.—A Pre-medical course, leading to the degree of B. S.
E.—A course in mechanical engineering, leading to the degree of B. S. in Engineering.

The work of the year is divided into equal semesters. One hour's work is one hour recitation or lecture through one semester, with the required preparation. Two and one-half hours of laboratory work, shop work, or drawing counts the same as one of the lecture or of recitation. At least one hundred and thirty hours as here defined are required for graduation. A student's choice of elective work is subject to the approval of the Faculty, which reserves the right of refusing to give any elective course for which there are less than three approved applicants.

ADMISSION TO COLLEGIATE COURSES

Candidates for admission to the first year class in any of the collegiate courses of the University must be at least sixteen years old and present evidences of good moral character.

Students coming from other colleges and universities must bring certificates of honorable dismissal.

Admission may be made:

(a)—By certificate.

1. Graduates of the accredited high schools of Montana are admitted to the collegiate departments of the University on presentation of their diplomas, accompanied by a certificate from the superintendent of their respective schools.

2. Students coming from any other school or college are required to bring all grade cards, certificates or diplomas that they may possess, together with written statements from teachers, superintendents or principals, in order that a proper estimate may be made of their past work.

(b)—By examination.

Examinations for entrance will be given on days set in calendar of this catalogue.

REQUIREMENTS FOR 1908-1909

On the basis of a four years' preparatory course, fifteen units will be required for admission.

The term unit means one subject pursued for at least thirty-six weeks with not less than five recitations per week, of not less than forty minutes each.

The following is the list of the subjects from which choice must be made, and of the number of units which may be selected in each subject:

English Composition and Literature, 3 or 4.
Mathematics (Algebra and Geometry), 3.
Mathematics (Trigonometry), ½.
History, 1, 2 or 3.
Latin, 2, 3 or 4.
German, 2, 3 or 4.
French, 2, 3 or 4.
Physics, 1.
Chemistry, 1.
Biology, 1.
Botany, 1.
Zoology, 1.
Free-Hand Drawing, ½.

When Biology is elected, credit cannot be given for Botany and Zoology.

The fifteen units required for admission must include the following:

English Composition and Rhetoric, 3.
Mathematics (Algebra, Geometry—Plane and Solid), 3.
Physics, 1.
History, 1.
Latin, German or French, 2.

The remaining five units may be selected from the list above.
Four units of Latin are required for the classical group.

OUTLINE OF REQUIREMENTS

I. ALGEBRA.—Fundamental operations (including special rules for multiplication and division); factoring; highest common factor and lowest common multiple by factoring; fractions; linear equations (integral, fractional, simultaneous); involution and evolution; quadratic

equations (including simultaneous); graphical representation and solution of equations; radicals; theory of exponents; imaginary numbers; ratio and proportion; arithmetic progression; geometric progression; theory of logarithms. One and one-half units.

II. GEOMETRY, PLANE AND SOLID.—The equivalent of the subject-matter in any of the standard texts, supplemented by some such work as Estill's "Numerical Problems in Plane Geometry." One and one-half units.

III. ENGLISH.—

(1) COMPOSITION.—The applicant must be familiar with the English composition required in the four year high school course of the accredited high schools in Montana. Those who do not present a satisfactory certificate will be required to pass an examination. Serious deficiency in spelling, punctuation, form, sentence-structure, grammatical inflections, or clearness of thought may be sufficient grounds for rejection of the applicant's work and his exclusion from the first year of college English.

(2) LITERATURE.—The applicant must be familiar with the form and substance of the classics, or of their equivalents, in (a), and must possess a general knowledge of the subject-matter in two or more of those in (b) of the following groups:

(a) Shakespeare's **Macbeth, Merchant of Venice,** and **Julius Caesar**; Macauley's **Essay on Milton,** or **Essay on Addison**; Tennyson's **Idylls of the King** and **Princess**; Milton's **Lycidas, Comus, L'Allegro,** and **Il Penseroso**; Burke's **Speech on Conciliation with America**; Carlyle's **Essay on Burns**; Gayley's **Classic Myths.**

(b) Scott's **Kenilworth** or **Ivanhoe,** De Quincy's **Revolt of the Tartars,** Eliot's **Silas Marner,** Dicken's **Tale of Two Cities** or **David Copperfield,** Wallace's **Ben Hur,** Blackmore's **Lorna Doone,** Kingsley's **Westward Ho!** selections from Addison's **Spectator,** Irving's **Life of Goldsmith,** Coleridge's **Rime of the Ancient Mariner.**

IV. HISTORY.—

One unit of history should embrace the history of ancient nations, with special reference to Greece and Rome. Myers or West or equivalent.

The second unit should embrace the history of medieval and modern Europe. Myers or West or equivalent.

The third unit may be in English history. Andrews or equivalent.

The fourth should embrace American history, Channing or equivalent; and Civil Government, Fiske or equivalent.

V. LATIN.—Two units in Latin should cover the work of a good beginning Latin book and the reading of four books of Caesar's Gallic War.

Three units should include the above and five orations of Cicero.

Four units should give in addition the reading of six books of Vergil's Aeneid. There should also be practice in writing Latin during the reading of the texts above mentioned. Systematic grammatical instruction and drill by illustration. Composition exercises should be given throughout the work.

Equivalents for the texts indicated above will be allowed.

VI. GERMAN.—Grammar, Joyne's-Meissner, Whitney's or their equivalents. Ability to read easy prose fluently, and to translate at sight such work as "Hauff's Maerchen" (Goold).

VII. FRENCH.—Grammar, Chardennal's Complete, Edgren's or their equivalents. Ability to read easy prose fluently and to translate at sight such work as "La Pierre de Touche" (Harper).

VIII. PHYSICS.—One year of Elementary Physics, the equivalent of Carhart and Chute's Elementary Physics, Gage's Principles of Physics, or Avery's Elements, one-half of the time having been devoted to laboratory work. The student's note book in laboratory practice will be considered evidence of having done this work.

IX. BIOLOGY.—One year's work in Biological Science, with half the time given to Laboratory work, the equivalent of Davenport's Elementary Zoology, or Linville and Kelley's Elementary Zoology, for class; and Kingsley or Colton in Laboratory, with accompanying special reading or study.

X. CHEMISTRY.—One year's work, the equivalent of Remsen's Beginning Course. One-half of the time must be given to laboratory work, as certified by student's note book.

GRADUATION AND DEGREES

In order to secure the recommendation of the Faculty for graduation from the University in any of the respective lines of work that have been outlined, it is necessary for the student to complete the equivalent of at least one hundred and thirty hours' work, as already defined in the section concerning collegiate courses.

That the needs and special inclinations of the different students may be consulted as far as possible, certain of these hours are required for each of the respective degrees and the rest are left for the student's selection.

The work required for the completion of the three courses in the College of Letters and Science shows at a glance the difference in the courses. Certain subjects are required of all students, others are required in special courses, others must be elected from definite lines of work and still others are free electives. It is understood that the choice in free electives must in part be governed by the arrangement of subjects on the daily program, and that precedence will always be given to required work for the different degrees and the number of partial elective hours allowed.

Special students in the Department of Education will select a major and two related minor subjects. At least half and not more than two-thirds of their work must be done in these three departments.

GENERAL WORK REQUIRED FOR DEGREES, EXCEPTING B. S. IN ENGINEERING

Rhetoric, I	3 hours
Political Economy, I	3 hours
Psychology, I	5 hours
Literature,	7 hours
Biology, I, II	8 hours
Chemistry, I, II	8 hours
Mathematics, I	5 hours
Elocution, I, II	4 hours
History, I	3 hours
Library Science	1 hour
Physical Culture	2 hours
General required work	49 hours

WORK REQUIRED FOR DEGREE B. A.

(Classical Group.)

General required work (given above)	49 hours
Special required work, Latin	24 hours
Special required work, Greek Life	3 hours
Special required work, Roman Life	3 hours
Partial Electives in Greek, Latin, Modern Languages	22 hours
Free Electives	29 hours
Total	130 hours

(Literary Group.)

General required work (given above)	49 hours
Partial Electives, Ancient and Modern Languages	22 hours
Partial Electives, History, Literature and Philosophy	32 hours
Free Electives	27 hours
Total	130 hours

(Pedagogical Group.)

General required work (given above)	49 hours
Latin and Greek	24 hours
Philosophy and Education	23 hours
Partial Electives, Literature and Language	15 hours
Free Electives	19 hours
Total	130 hours

WORK REQUIRED FOR DEGREE B. S.

(General Science Group.)

General required work (given above)	49 hours
Special required work, Mathematics, II	5 hours
Special required work, Physics	8 hours
Partial Electives, Modern Languages	16 hours
Partial Electives, Science and Mathematics	24 hours
Free Electives	28 hours
Total	130 hours

(Pedagogical Group.)

General required work (given above)	49 hours
Mathematics, II	5 hours
Physics	8 hours
Modern Languages	16 hours
Philosophy and Education	23 hours
Partial Electives, Science and Mathematics	15 hours
Free Electives	14 hours
Total	130 hours

(Pre-Medical Group.)

General required work (given above)	49 hours
Partial Electives, Modern Languages	16 hours
Special required work—	
Mathematics, II	5 hours
Biology; Vertebrate Zoology, Bacteriology, Embryology, Human Anatomy	14 hours
Chemistry; Qualitative Analysis, Quantitative Analysis, Organic, Physical Chemistry	16 hours
Physics	8 hours
Free Electives	22 hours
Total	130 hours

(Pre-Mining Group.)

General required work	49 hours
Mathematics Courses II, III and IV.	13 hours
Geology Courses I and II.	8 hours
Chemistry Courses III-A, III-B, IV, V, VI.	20 hours
Mineralogy Courses III and IV.	8 hours
Free Electives	32 hours
Total	130 hours

(Technical Chemistry Group.)

General required work (given above)	49 hours
Physics, I and II	8 hours
German	10 hours
Mathematics, II and III	10 hours
Qualitative Analysis	5 hours
Quantitative Analysis	8 hours
Physical Chemistry	6 hours
Mechanical Drawing	4 hours
Descriptive Mechanics	4 hours
Analytic Mechanics	4 hours
Machine Design	2 hours
Electrical Machinery	3 hours
Free Electives	17 hours
Total	130 hours

Students who are specializing in Physiological Chemistry and those who wish to have merely a non-mathematical knowledge of Chemistry, may substitute work in any science courses for the above required Mechanical Engineering and Calculus.

WORK REQUIRED FOR DEGREE B. S. IN ENGINEERING

Roman numerals indicate courses; Arabic, hours credit.

FIRST YEAR.

FIRST SEMESTER	SECOND SEMESTER
Mathematics, I. 5	Mathematics, II. 5
Chemistry, I. 4	Chemistry, II. 4
English, I. 4	English, II. 2
Mechanical Drawing, I. 2	Mechanical Drawing, I. 2
Shop Work, I. 3	Shop Work, I. 3
French or German, (Optional), 3	French or German, (Optional), 3

SECOND YEAR.

Mathematics, III. 5	Mathematics, IV. 3
Physics, I. 4	Physics, II. 4
Surveying, VI-A. 3	Surveying, VI-A. 3
Field Work and Topography, Topographical Drawing, VI-B. 3	Descriptive Geometry, II-B. 2
Descriptive Geometry, II-A. 2	Field Work and Topography, and Topographical Drawing, II. 3
French, German or Spanish, (Optional), 4	English, 2
	French, German or Spanish, (Optional), 4

THIRD YEAR.

Analytical Mechanics, I. 4	Analytical Mechanics, I. 4
Graphic Statics, IV. 2	Strength of Materials, VII. 3
Theoretical Electricity, and Electrical Measuring Instruments, IX-A. 4	Theoretical Electricity and Electrical Measuring Instruments, IX-B. 2
Mechanism and Gear Teeth, V-A. 3	Valve Gears, V-B. 3
Engineering Drawing, III., 2	Assaying, 2
Differential Equations, VII-B. 3	Least Squares and Precision of Measurements, VII. 2

FOURTH YEAR.

Hydraulics, II. 3	Hydraulics and Hydraulic Motors, III. 3
Thermodynamics, IV-A. 3.	Steam Engineering, IV-B. 2
Machine Design, V. 2	Theoretical Electricity, X. 3
Theoretical Electricity, X. 4	Electrical and Mechanical Machine Design, VI. 2
Engineering Laboratory, VIII. 2	Engineering Laboratory, VIII. 2
OPTIONS—	Industrial Management, XI. 1
Mill Engineering, XIII. 3	Thesis, XII. 2
Telephony, XIV. 3	OPTIONS—
Dynamo Design, XV. 3	Mill Engineering, XIII. 3
Heating and Ventilating, XVI. 3	Telephony, XIV. 3
	Dynamo Design, XV. 3
	Heating and Ventilating, XVI. 3

POST GRADUATE COURSES AND DEGREES

For those who wish to devote still further time to preparation for professional work, a two years' course in mechanical and electrical studies is offered, leading to the degree of Mechanical or Electrical Engineer, according to the studies elected.

An advanced course of study in Civil Engineering, extending over two years, is also offered, for the successful completion of which the degree of Civil Engineer is conferred.

POST GRADUATE MECHANICAL AND ELECTRICAL ENGINEERING

FIRST YEAR.

FIRST SEMESTER	SECOND SEMESTER
Applied Mechanics, XVII., 4	Applied Mechanics, XVII., 4
Electrical and Mechanical Machine Design, XVIII., 6	Electrical and Mechanical Machine Design, XVIII., 6
Vector Analysis, 4	Fourie's Series and Spherical Harmonics, 3
Fourie's Series and Spherical Harmonics, 3	Theoretical Electricity, XIX., 4
Electro-Chemistry and Metallurgy, 4	Electro-Chemistry and Metallurgy, 4
Theoretical Electricity, XIX. 4	Electric Railway Engineering, XXI., 4
Electric Railway Engineering, XXI., 4	Thesis, XXXIII., 3
Thesis, XXXIII., 3	

SECOND YEAR.

Electrical and Mechanical Machine Design, XVIII., 6	Theory of Potential, 5
Electrical Engineering, XX., 4	Electrical and Mechanical Machine Design, XVIII., 6
Steam Turbine Engineering, XXII., 4	Electrical Engineering, XX., 4
Electric Railway Engineering, XXI., 4	Hydro-Electric Power Plants, XXIII., 4
Industrial Management, XXIV., 2	Electric Railway Engineering, XXI., 4
Thesis, XXXIII., 4	Industrial Management, XXIV., 2
	Thesis, XXXIII., 4

POST GRADUATE CIVIL ENGINEERING

FIRST YEAR.

Applied Mechanics, XVII., 4	Applied Mechanics, XVII., 4
Hydraulic Measurements, XXV., 2	Geology and Mineralogy, 2
Geology and Mineralogy, 3	Sewers and Water Works, 2
Sewers and Water Works, XXVI., 3	Retaining Walls and Dams, XXVII., 2
Retaining Walls and Dams, XXVII., 2	Municipal Engineering, XXIX., 2
Advanced Surveying, XXVIII., 4	Railroad Engineering, XXX., 3
Thesis, XXXIII., 3	Thesis, XXXIII., 3

SECOND YEAR.

Design, XVIII-A., 4 Municipal Engineering, XXIX., 2 Bridge Engineering, XXXII., 2 Railroad Engineering, XXX., 3 Steel Frame Buildings, XXXI., 2 Thesis, XXXIII., 4	Design, XVIII-A., 4 Municipal Engineering, XXIX, 2 Steel Frame Buildings, XXXI., 2 Railroad Engineering, XXX., 3 Thesis, XXXIII., 4

SCHEME OF COURSES OFFERED BY THE UNIVERSITY

*These courses are the general requirements for college courses.

**Technical courses in Engineering.

Roman numerals indicate the number of the course; Arabic indicate the number of recitations per week.

ENGLISH AND RHETORIC

FIRST SEMESTER	SECOND SEMESTER
*Elementary Rhetoric, I. M., W., F. 9:30.	Description and Exposition, II. T., Th. 9:30.
Argumentation and Persuasion, III. M., W. 10:30.	Narration, IV. M., W., F. 9:30.
Versification, V. T., Th. 10:30.	Prose, VI. T., Th. 1:30.
Old English, VII. M., Th. 11:30.	Ballads, X. T., Th. 11:30.
History of the English Language, IX. T., F. 11:30.	Middle English, VIII. M., F. 11:30
	Myths and Ballads, XII. 1.

LITERATURE

Literature, I. 2. T., Th. 1:30.	Literature, II. 2. T., Th. 8:30.
Literature, III. 2. T., Th. 9:30.	Literature, IV. 5. M., W., F. 9:30.
Literature, V.	Literature, VI. 5. T., Th., 1:30.
Literature, VII. 5. M., W., F. 8:30.	Literature, VIII. 3. M., W., F. 8:30.
Literature, IX. 5. M., W., F. 11:30.	Literature, X. 2. T., Th. 11:30.
Literature, XI.	Literature, XII.

ELOCUTION AND PHYSICAL CULTURE

*Elocution, I. T., Th. 8:30.	*Elocution, II. T., Th. 8:30.
Elocution, III. 3.	Elocution, IV. 2.
Oration and Debate. 2.	Sight Reading. 2.
*Physical Culture. 2.	*Physical Culture. 2.

LATIN

Latin, I. Cicero, Composition. 3. M., W., F. 9:30.	Latin, II. Continuation of I. 3. M., W., F. 9:30.
Latin, III. Horace. 4. 8:30.	Latin, IV. Livy and Tacitus. 4. 8:30.
Latin, V. Plautus. T., Th., F. 11:30.	Latin, VI. Terence. T., Th., F. 11:30.
	Roman Life, VII. M., W., F. 1:30.

GREEK

FIRST SEMESTER	SECOND SEMESTER
Greek, I. Grammar and Lessons. 5. Greek, III. Anabasis. 5. Greek, V. Herodotus, Thucydides. 5. Greek, VII. Plato. 5. Private Life of the Greeks, IX. M., W., F. 1:30.	Greek, II. Anabasis. 5. Greek, IV. Iliad. 5. Greek, VI. Demosthenes. 5. Greek, VIII. Greek Dramatists. 5.

GERMAN

German, I. Becker—Grammar. M., T., W., Th. 8:30. Grammar, III. Bernhard—Composition, Conversation. M., T., Th., F. 11:30. German, V. Schiller's Wallenstein —Conversation and Composition—Ekkehart. 3.	German, II. Same. Carruth Reader. M., T., W., Th. 8:30. German, IV. Wilhelm Tell. Composition and Conversation. M., T., Th., F. 11:30. German, VI. Faust. 3. Deutsche Lit. Geschichte. Conversation and Composition. Aus dem Reich Friedrichs des Grossen.

FRENCH

French, I. Chardenal's Complete Grammar. M., T., Th., F. 9:30. French, II. Napoleon. L'Abbe Constantin. M., W., F. 10:30. French, V. Histoire de la Lit. Francaise. Composition and Conversation. T., Th., 10:30. Les Miserables. Notre Dame de Paris. F. 2:00.	French, II. Chardenal's Complete Grammar. Contes, Daudet. M., T., Th., F. 9:30. French, IV. Colomba. M., W., F. 10:30. Racine— Esther. Athalie. French, VI. Modern Writers and Classics. Composition and Conversation. T., Th., 10:30. F., 2:00.

SPANISH

Spanish, I. Schilling's Spanish Grammar. 3. M., W., F. 2:30. Spanish, III. Same. La Vida es Sueno. El si de las Ninas. 3. Spanish, V. Ruy Blas. 3.	Spanish, II. Same. M., W., F. 2:30. Spanish, IV. Modern Writers. 3. Spanish, VI. Cervantes. 3.

CHEMISTRY

FIRST SEMESTER	SECOND SEMESTER
*General Inorganic, I. 4. T., Th. 9:30.	*General Inorganic, II. 4. T., Th. 9:30.
Chemistry of Foods, II. b. 1 or 2.	Sanitary Chemistry, II. b. 1 or 2.
Qualitative Analysis, III. 5.	Qualitative Analysis, III. b. 4.
Introductory Quantitative Analysis, IV. 4.	Introductory Quantitative Analysis, IV. 4.
Mineral Analysis, VI. 4.	Assaying, V. 3.
Organic Chemistry, VII. 2.	Mineral Analysis, VI. 4.
Organic Preparations, IX. 2.	Organic Chemistry, VIII. 2.
Physical Chemistry, XI. 3.	Organic Preparations, X. 2.
Electro Chemistry, XIII. 4.	Physical Chemistry, XII.
Industrial Chemistry, XV. 3.	Metallurgy, XIV. 3.
Gas Analysis, XVI. 2.	Gas Analysis, XVI. 2.
Organic Analysis.	Organic Analysis.
Inorganic Preparations, XVIII. 4.	Inorganic Preparations, XIX. 4.
Physiological Chemistry, XX. 4.	Physiological Chemistry, XXI. 4.
Sanitary Water Analysis, XXII. 2 or 4.	Sanitary Water Analysis, XXII. 2 or 4.
Mineral Water Analysis, XXIII. 4.	Mineral Water Analysis, XXIII. 4.
Photography, XXIV.	Research, XXV. 4 to 20.
Research, XV. 4 to 20.	

PHYSICS

Physics, I. 4 hours.	Physics, II. 4 hours.
Physics, III. Electrical Measurements. 3 hours.	Physics, IV. Advanced.
Physics, V. Light. 2 hours.	Experimental Physics, 2 or 4 hours.
Physics, VI. Heat. 2 hours.	Physics, V. Light. 2 hours.
Physics, VII. Special. 2 or 4 hours.	Physics, VI. Heat. 2 hours.
	Physics, VII. Special. 2 or 4 hours.

GEOLOGY AND MINERALOGY

General Geology, I. 4 hours.	General Geology, II. 4 hours.
Mineralogy, III. 2 or 4 hours.	Mineralogy, III. 2 or 4 hours.
Lithology, IV. 2 or 4 hours.	Lithology, IV. 2 or 4 hours.
Paleontology, IX. 2 or 4 hours.	Paleontology, IX. 2 or 4 hours.
Economic Geology, V. 2 or 4 hours.	Blow-Pipe Analysis, VI. 2 or 4 hours.
Petrography, VII. 2 or 4 hours.	Advanced Geology, VIII. 2 or 4 hours.
Advanced Geology, VIII. 2 or 4 hours.	Special Work, X.
Special Work, X.	Ores, XII. 4 hours.
Physical Geography, XI. 4 hours.	Graduate Work.
Organic Evolution, XIII. 2 hours.	

BIOLOGY

FIRST SEMESTER	SECOND SEMESTER
*Biology, I. 4. T., Th., 10:30; laboratory, 1:30 to 4; two afternoons.	*Biology, II. 4. T., Th., 10:30; laboratory, 4:30 to 4:00, two afternoons.
Biology, III. Zoology of Invertebrates. 4. T., Th., at 8:30; laboratory at hours to be arranged.	Biology, IV. Zoology of Vertebrates. 4. T., Th., at 8:30; laboratory at hours to be arranged.
Biology, V. Botany. 4. Recitation and laboratory at hours to be arranged.	Biology, VI. Botany. Recitation and laboratory at hours to be arranged.
Biology, VII. Organic Evolution. 2. T., Th., 11:30.	Biology, VIII. Human Anatomy. 4. M., T., Th., F., 11:30; laboratory hours to be arranged.
Course IX. Bacteriology. 3. T., 9:30; laboratory at hours to be arranged.	Course X. Entomology. 3 to 5. T., Th., 8:30; laboratory hours to be arranged.
Course XI. Research. 4 to 6. T., Th., at 9:30; laboratory at hours to be arranged.	Course XI. Research. 4 to 6. T., Th., at 9:30; laboratory at hours to bearranged.

MATHEMATICS

*Mathematics, I. 5.	Mathematics, II. 5.
Mathematics, III. 5.	Mathematics, IV. 3.
Analytic Mechanics, V. 4.	Analytic Mechanics, V. 4.
Differential Equations, VI. 3.	Least Squares, VII. 2.
History of Mathematics, IX. 3.	Spherical Trigonometry, VIII. 2.
Theory of Equations, XI. 3.	Teachers' Course, X. 3.
General Astronomy, XII. 3.	Solid Analytic Geometry, XIII. 4
Advanced Integral Calculus, XIV. 4.	Modern Analytic Geometry, XVI. 4.
Differential Equations, XV. 3.	Functions of a Complex Variable, XVII. 4.

DRAWING AND PAINTING

Black and White Work, I. 2.	Black and White Work, II. 2.
Black and White Work, III. 2.	Black and White Work, IV. 2.
Water Color Painting, V. 2.	Water Color Painting, VI. 2.
Water Color Painting, VII. 2.	Water Color Painting, VIII. 2.
Oil Painting, IX. 2.	Oil Painting, X. 2.
Oil Painting, XI. 2.	Oil Painting, XII. 2.
Design, XIII. 2.	Design, XIV. 2.
Teachers' Drawing, XV. 2.	Teachers' Drawing, XVI. 2.
History of Painting, I. 2.	History of Sculpture, III. 2.
History of Architecture, II. 2.	

PHILOSOPHY AND EDUCATION

FIRST SEMESTER	SECOND SEMESTER
Introductory Psychology, I. 3.	Logic, VI. 2.
Experimental Psychology, II. 2.	Ethics, VII. 2.
Genetic and Applied Psychology, XI. 3.	History of Education, IV. 3. 5.
Advanced Psychology, XII.	Educational Classics, V. 2.
Psychological Seminary, XVI. 1.	Educational Psychology, IX. 3.
Introduction to Philosophy, III. 2.	Principles of Teaching, VIII. 2.
History of Philosophy, X. 3.	High School Pedagogy, XIV. 3.
	Study of Children, XV. 2.

HISTORY AND ECONOMICS

European History, I. 3.	European History, II. 3.
English History, III. 3.	English History, IV. 3.
American History, V. 3.	American History, VI. 3.
Economics, I. 3.	Economics, II., III. or IV. 3.
Economic Evolution, V. 3.	Economic Problems, VI. 3.
Politics, VII. 3.	Sociology, VIII. or IX. 3.
Seminar, X. 1.	Seminar, XI. 1.

BACCALAUREATE DEGREES

The University grants the following baccalaureate degrees for undergraduate work:

I. The degree of Bachelor of Arts to those who complete either the Classical group or the Literary group in the College of Liberal Arts.

II. The degree of Bachelor of Science to those who complete the Scientific course.

III. The degree of Bachelor of Science in Engineering to those who complete the course in Engineering.

ADVANCED DEGREES

Master of Arts, Master of Science. The Degree of Master of Arts or Master of Science will be conferred upon resident graduates on the following conditions:

I. The candidate must be a graduate of this University, or a University or College of good standing, as approved by the Faculty.

II. He must have pursued, during one or more years, a course of graduate study at this University, the minimum requirement of work being represented by forty hours of credit.

III. The candidate may pursue one major study and two minors, one major and one minor, or may devote his entire time to the major, the division of time and arrangement of work to receive the recommendation of the department in which the major work is taken and the approval of the Faculty. In any case one-half of the candidate's work must be on the major subject.

IV. The minor or minors must be closely allied to the major subject, provided, however, that any candidate, in residence for two or more years, may select any approved subject as a second minor for a degree.

V. All courses of study leading to advanced degrees are subject to approval, first, by the head of the department of the University in which the major subject for each student belongs; second, by the Faculty. The signatures of the heads of the departments in which chosen minor subjects belong must also be obtained. This list of studies with the approval signatures must be deposited with the secretary of the Faculty. No changes may subsequently be made except under the same line of approvals, but extension of time may be arranged with the professors concerned.

VI. He must submit a thesis showing marked attainment in some branch of learning. The subject of the thesis must be announced to the Faculty for approval, not later than the second Friday in December, and the thesis itself must be presented to the examining committee at a date to be set by the professor in charge of the thesis work, not later, in any case, than May 20th of the year in which the degree is expected.

VII. He must, at the close of his course, pass a satisfactory examination, either oral or written, or both, conducted by a committee which shall consist of three professors, selected by the Faculty for this purpose.

VIII. The degree of Master of Arts will be conferred only upon the completion of a course mainly literary in character, and the degree of Master of Science upon one mainly scientific. The degree of Mechanical Engineer will be conferred on those holding the degree B. M. E. on the same conditions as in the other courses.

IX. Graduate students pursuing courses for the Master's degree may, by special permission of the Faculty, carry a portion of the work in absentia; but at least one-half the work must be done in residence.

PREPARATORY WORK

The closing of the Preparatory School at the University will begin in the year 1908-1909 by dropping the work of the first year.

Students previously enrolled in this school, who have finished the first year's work, and all new applicants prepared for the work of the second, third or fourth years will be admitted and furnished with the work for which they are prepared.

This preparation may be shown by examination or by satisfactory certificates of work done elsewhere.

Certificates from county boards of examiners in the State and teachers' certificates will be accepted for work below the first year of the Preparatory Course.

Entrance examinations will be given to test completion of

the first year of high school work as outlined in the Classical or Scientific courses for accredited high schools, on page 79.

SUBJECTS AND CLASSES OFFERED

The following subjects are pursued in the Preparatory work. The time which may be devoted to each subject is indicated by units.

A unit is five recitations per week of forty minutes each, during one school year,

English (Composition, Rhetoric and Literature). 3 or 4.
Mathematics (Algebra, Geometry—Plane and Solid). 3.
History. 2.
Latin. 2, 3 or 4.
German. 2.
Physics. 1.
Biology. 1.
Free-Hand Drawing. ½.
Mechanical Drawing and Shop Work. 2.

Fifteen units at least must be completed.
The following units are required of all:

English. 3.
Mathematics. 3.
History. 2.
Physics. 1.
Free-Hand Drawing. ½.

The rest of the required units may be selected from the list given above.

When Latin or German are selected they must be pursued for at least two years.

Four units of Latin are required for the classical group of college work, and at least two units of Latin or German for all the other college groups.

ACCREDITED HIGH SCHOOLS

The State Board of Education in a meeting held June 1, 1896, took the following action:

"Candidates seeking admission to any of the regular courses in any state educational institution must be at least sixteen years of age and must possess a good moral character and good bodily health.

"Accredited Schools.—Any high school or academy whose course of instruction covers the branches requisite for admission

to one or more of the courses of any State educational institution may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a committee appointed by the State Board of Education. Application for such examination may be made by any school board to the Secretary of the State Board of Education, whereupon a committee appointed by the State Board of Education will examine the course of study and methods of instruction of the school and on the committee's favorable recommendation, and the concurrence of the State Board of Education, it will be entered upon the accredited list of the state educational institution for which it applied. Any graduate of such an approved school will be received by the president of the state educational institution wherein said graduate is entitled to enter, on presentation of proper diploma and certificate from the superintendent of said school, into any of the courses of said institution for which said graduate has been fitted.

"Students of any accredited school who are not graduates must expect examinations as other candidates.

"A school once entered upon the accredited list will remain there until its administration is changed, or until notice is given by the State Board of Education of unsatisfactory results. Upon a change of administration application for continuation upon the list, if desired, must be made. If the work of the principal coming into charge has been recently examined in connection with some other school, a new examination may not be required, but such examination should in all cases be invited.

"Annual reports will be asked for by the State Board of Education from all accredited schools."

This legislation is still in force.

At the December meeting of the Board it appointed a committee "to formulate a uniform plan for accredited high schools." The committee met in Helena, December 8, 1897, and formulated a plan, and a brief outline of work of accredited high schools, which was adopted at the next meeting of the State Board of Education.

"This committee decided to recommend to the Board that the work of the eight grades, when arranged, shall be the standard for entrance to the high schools."

This recommendation, which was adopted by the Board, became of effect in 1899, when the State Common School Course of Study was published and placed in the hands of school boards, teachers and superintendents, and it still remains in force.

In June, 1899, the State Board of Education instructed the Diploma Committee to revise the course of study for accredited high schools. At the December meeting the committee asked for further time, which was granted. At the regular meeting of

the Board in June, 1900, the Diploma Committee reported a three years' course of study, which was unanimously adopted.

In December, 1905, the President of the University recommended that the Preparatory Department of the University be discontinued after September 1, 1908, and that at this date the Accredited High Schools be required to sustain a four years' course of study. The recommendation was unanimously adopted. President O. J. Craig of the University, State Superintendent W. E. Harmon, and Superintendent S. D. Largent were appointed a committee to prepare a four years' course of study for accredited high schools.

The following course was prepared by the committee, and reported to the State Board of Education in June, 1906. It was formally adopted December 4, 1906.

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

FIRST YEAR— FIRST SEMESTER

Classical Course	Scientific Course.	English Course	Commercial Course.
Latin— First Lessons. Latin Grammar. Algebra. History— Eastern Nations and Greece. English— Composition and Rhetoric. American Authors. Drawing— Twice a week.	Latin— First Lessons. Latin Grammar. Algebra. Physiography, or History— Eastern Nations and Greece. English— Composition and Rhetoric. American Authors. Drawing— Twice a week.	Word Study and Grammar, or Latin. Algebra. Physiography, or History— Eastern Nations and Greece. English— Composition and Rhetoric. American Authors. Drawing— Twice a week.	Word Study and Grammar, or Latin. Algebra. Physiography, or History— Eastern Nations and Greece. English— Composition and Rhetoric. American Authors. Drawing— Twice a week.

FIRST YEAR—SECOND SEMESTER

Classical Course	Scientific Course	English Course	Commercial Course
Latin— First Lessons. Latin Grammar. Algebra. English— Composition and Rhetoric. American Classics. History— Roman. Drawing— Twice a week.	Latin— First Lessons. Latin Grammar. Algebra. English— Composition and Rhetoric. American Classics. History— Roman. Drawing— Twice a week.	Word Study and Grammar, or Latin. Algebra. English— Composition and Rhetoric. American Classics. Physiology, or Roman History. Drawing— Twice a week.	Word Study and Grammar, or Latin. Algebra. English— Composition and Rhetoric. American Classics. Physiology, or Roman History. Drawing Twice a week.

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

SECOND YEAR—FIRST SEMESTER

Classical Course	Scientific Course	English Course.	Commercial Course
Latin— Caesar. Algebra. English— Composition and Rhetoric. American and English Authors. History— Mediaeval. Drawing— Twice a week.	Latin— Caesar. Algebra. English— Composition and Rhetoric. American and English Authors. Botany, or Mediaeval History. Drawing— Twice a week.	Latin, or Botany. Algebra. English— Composition and Rhetoric. American and English Authors. History— Mediaeval Drawing— Twice a week.	Commercial Arithmetic. Commercial Geography. English— Composition and Rhetoric. American and English Authors. History Mediaeval. Drawing— Twice a week.

SECOND YEAR—SECOND SEMESTER

Classical Course	Scientific Course	English Course	Commercial Course.
Latin— Caesar. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— Twice a week.	Latin— Caesar. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Botany, or Modern History. Drawing— Twice a week.	Latin, or Botany. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— Twice a week.	Commercial Arithmetic. Plane Geometry. English— Composition and Rhetoric. American and English Authors. History— Modern. Drawing— Twice a week.

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

THIRD YEAR—FIRST SEMESTER

Classical Course	Scientific Course	English Course	Commercial Course
Latin— Cicero. Plane Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Plane Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Latin. French. German. English History. (Select two.)	Bookkeeping. Plane Geometry. English— Composition and Rhetoric. American and English Authors. Stenography and Typewriting.

THIRD YEAR—SECOND SEMESTER

Classical Course	Scientific Course	English Course.	Commercial Course
Latin— Cicero. Solid Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Solid Geometry. English— Composition and Rhetoric. American and English Authors. English History, or French, or German.	Chemistry. Solid Geometry, or Economics English— Composition and Rhetoric. American and English Authors. Latin. French. German. English History (Select two.)	Economics. Bookkeeping. English— Composition and Rhetoric. American and English Authors. Stenography and Typewriting.

COURSE OF STUDY FOR ACCREDITED HIGH SCHOOLS

FOURTH YEAR—FIRST SEMESTER

Classical Course	Scientific Course	English Course	Commercial Course
Latin— Vergil. Physics. English— History of English Literature. American History and Civics, or French, or German.	Trigonometry. Physics. English— History of English Literature. American History and Civics, or French, or German.	French. German. Latin. Trigonometry. (Select two.) Physics. English— History of English Literature. American History and Civics.	Correspondence. Bookkeeping. American History and Civics. Stenography and Typewriting.

FOURTH YEAR—SECOND SEMESTER

Classical Course	Scientific Course	English Course	Commercial Course
Latin— Vergil. English— Masterpieces with applications of principles of English Grammar. American History and Civics, or French, or German. Physics.	Physics. English— Masterpieces with applications of principles of English Grammar. American History and Civics, or French, or German. Review— Mathematics.	Physics. English— Masterpieces with applications of principles of English Grammar. American History and Civics. Commercial Law. Mathematics. French. German. Latin. (Select two.)	Commercial Law. Bookkeeping. American History and Civics. Stenography and Typewriting.

LIST OF THE ACCREDITED HIGH SCHOOLS

CITY HIGH SCHOOLS

City	Superintendent
Anaconda	W. K. Dwyer
Billings	C. S. Brother
Butte	R. G. Young
Chinook	G. H. Willman
Columbus	James H. Doyle
Forsyth	W. F. Clark
Fort Benton	J. W. Lenning
Great Falls	S. D. Largent
Hamilton	J. V. Owen
Havre	T. J. Troy
Helena	Frank R. McKenna

COUNTY HIGH SCHOOLS

County	Principal
Beaverhead—Dillon	L. R. Foote
Broadwater—Townsend	John M. Kay
Carbon—Red Lodge	L. D. Fallis
Custer—Miles City	R. H. Daniels
Dawson—Glendive	Ralph L. Hunt
Fergus—Lewistown	P. M. Silloway
Flathead—Kalispell	G. A. Ketcham
Gallatin—Bozeman	E. J. Parkin
Granite—Philipsburg	G. T. Bramble
Jefferson—Boulder	Byron E. Toan
Missoula—Missoula	J. F. Thomas
Park—Livingston	Lewis Terwilliger
Powell—Deer Lodge	E. T. Eaton
Sweet Grass—Big Timber	W. C. Ryan
Teton—Choutcau	W. W. Jones

REGISTER OF STUDENTS

1907-1908.

DEGREES CONFERRED JUNE, 1908.

Ethel Olive Ambrose (Literary), B. A. .... Missoula
Agnes Dorothea Berry (Literary), B. A. .... Missoula
Oral Jay Berry (Science), B. S. .... Granite
Charles Amos Buck (Engineering), B. S. .... Stevensville
Nell Cavette Bullard (Literary), B. A. .... Missoula
Vincent Stuart Craig (Engineering), B. S. .... Missoula
Arthur George Davidson (Engineering), B. S. .... Anaconda
Marjory Winnifred Feighner (Literary), B. A. .... Missoula
Phoebe Aditha Finley (Classical), B. A. .... Missoula
Helen Goddard (Classical), B. A. .... Billings
Carrie Elizabeth Hardenburgh (Literary), B. A. .... Missoula
Fanny Hatheway (Classical), B. A. .... Missoula
Frances Margaret Jones (Literary), B. A. .... Anaconda
Minta Lee McCall (Classical), B. A. .... Big Timber
Herman Cole McGregor (Engineering), B. S. .... Missoula
Arthur Ivason Morgan (Literary)' B. A. .... Marshfield, Oregon
May Elizabeth Murphy (Literary), B. A. .... Helena
Ruth Lenore Smith (Classical), B. A. .... Helena
Helen Antoinette Smead (Science) B. S. .... Missoula
James Beryl Speer (Literary), B. A. .... Petoskey, Mich.
Clarissa Spencer (Science), B. S. .... White Sulphur Springs
Roy Newton Whitesitt (Literary), B. A. .... Stevensville
Edward Angus Wenger (Engineering), B. S. .... Anaconda

GRADUATE STUDENTS.

Anna F. Carter, B. A. .... Missoula
Thomas Joseph Farrell, B. A. .... Missoula
Rufus King Garlington, B. S. .... Missoula
Josiah John Moore, B. S. .... Anaconda
Frances Nuckolls, B. A. .... Butte
Mary Stewart, A. B. .... Denver, Colo.
Joseph William Streit, B. S. .... Missoula

*COLLEGIATE

Ethel Olive Ambrose	Literary—121	Missoula
Keith K. Ambrose	Engineering—First Year	Missoula
Almeda Andrews	Classical—84½	Missoula
Flora Averill	Literary—41	Townsend
Agnes Dorothea Berry	Literary—110	Missoula
Oral Jay Berry	Science—111	Granite
Arthur F. Bishop	Engineering—Second Year	Seattle
Verena Black	Classical—8	Whitehall
Bess Margaret Bradford	Literary—76½	Missoula
Frank E. Bonner	Engineering—Second Year	Missoula
Kittie Bramble	Classical—58	Phillipsburg
Elmo Anson Brown	Literary—0	Billings
Charles Amos Buck	Engineering—Fourth Year	Stevensville
Mamie Burke	Classical—51	Missoula
Montana Buswell	Literary—70	Missoula
Nell Cavette Bullard	Literary—115	Missoula
Millard Bullerdick	Science—8½	Sheridan
Hazel Butzerin	Classical—41½	Missoula

*The numbers indicate credits at the close of the first semester, 1908.

Florence Elizabeth Catlin	Literary—43½—	Anaconda
Angus Downie Chisholm	Engineering—First Year	Ontonagon, Mich
Mamie Clanton	Science—24½	Billings
Willie C. Clanton	Science—18½	Billings
Belle Clark	Literary—8	Stevensville
Lila Miriam Cobban	Literary—46	Butte
Eva Coffee	Science—11½	Missoula
Effie Olivette Cordz	Science—50	Missoula
Vincent Stuart Craig	Engineering—Fourth Year	Missoula
Edwin A. Cullen	Science—10	Madison, Wis.
Ida Cunningham	Literary—52	Missoula
Henry Cyr	Engineering—First Year	Frenchtown
Arthur George Davidson	Engineering—Fourth Year	Anaconda
William E. C. Davis	Literary—102	Butte
Homer R. Dewell	Engineering—Third Year	Missoula
James Dingwall	Egineering—First Year	New Chicago
Oliver Ray Dinsmore	Engineering—First Year	Missoula
Amelia Eulalie Durfee	Classical—21	Philipsburg
Ceciel Katherine Dwyer	Literary—48½	Missoula
Isma Eidell	Literary—40½	Helena
Mary Josephine Elrod	Science—42½	Missoula
Ethel Charlotte Evans	Literary—75	Melrose
Charles Frederick Farmer	Engineering—Third Year	Missoula
Marjory Winnifred Feighner	Literary—122½	Missoula
Phoebe Aditha Finley	Classical—113	Missoula
Ernest W. Fredell	Engineering—Second Year	Anaconda
Marie Freeser	Science—54	Helena
Clarence Jenks Forbis	Engineering—First Year	Missoula
Hugh Temple Forbis	Engineering—First Year	Missoula
Frances Folsom Foster	Literary—44½	Great Falls
Fay Foster	Literary—7	Missoula
Edna Fox	Literary—48½	Twin Bridges
Frank Elliot Gleason	Engineering—First Year	Florence
Helen Goddard	Classical—111½	Billings
May Graham	Classical—61	Livingston
Verna Ellsworth Green	Literary—59	Helena
Frederick Greenwood	Literary—55	Spokane
Essie Mae Haley	Classical—44	Stevensville
Oscar Hamilton	Literary—19	Great Falls
Ray Hamilton	Engineering—First Year	Missoula
Mary Hansen	Literary—11½	Missoula
Carrie Elizabeth Hardenburg	Classical—120½	Missoula
Marshall Harnois	Literary—½	Missoula
William Lee Harriman	Engineering—First Year	Petoskey, Mich.
Eda Hatch	Classical—24	Lethbridge
Fanny Hatheway	Classical—118	Missoula
Mary Josephine Henderson	Literary—53½	Hall
Renee Henderson	Literary—53½	½ Hall
Zeal Hirt	Classical—57½	Townsend
Arthur Haffeditz	Engineering—Second Year	Anaconda
Charles Hoffman	Engineering—Irregular	Glasgow
Edna Hollensteiner	Classical—45½	½ Lolo

Eugene Howard	Engineering—Irregular	Missoula
Ethel Hughes	Literary—25	Missoula
Lillian Cornell Jacobs	Literary—61	Columbus
Laura Searight Johnson	Literary—43½	Great Falls
John Charles Johnson	Engineering—First Year	Missoula
Frances Margaret Jones	Literary—122½	Anaconda
James Jones	Engineering— First Year	Athlone, Ireland
Berney Kitt	Engineering—Third Year	Missoula
Lizzie Leaf	Classical—41½	Townsend
Arbie Eugene Leech	Literary—47	Chouteau
Ivan Earl Leininger	Engineering— Third Year	Windham
Frank Lewis	Engineering—Third Year	Missoula
Robert Campbell Line	Literary—54½	Columbus
George D. Little	Engineering—Second Year	Missoula
Irene Locke	Literary—35	Livingston
Ernest Kennedy Lovett	Engineering—First Year	Miles City
Olive Lovett	Classical—39½	Miles City
Margaret Mary Lucy	Literary—33	Missoula
Abbie Catherine Lucy	Literary—12	Missoula
Jennie Marguerite Lyng	Literary—18	Fort Benton
Harry David Maclay	Engineering—First Year	Missoula
Holmes Maclay	Engineering—First Year	Lolo
David Lamar Maclay	Literary—39	Lolo
Georgia McDonald	Classical—33½	Anaconda
Marjory Mason	Classical—46½	Philipsburg
John Maloney	Science	Butte
Joseph Malcomson	Literary	Detroit, Mich.
Agnes McBride	Literary—65	Iron Mountain
Minta Lee McCall	Classical—113	Big Timber
Eleanor McCall	Classical—50	Missoula
Charles S. McCowan	Literary—40½	Great Falls
Margaret McCampbell	Classical—19	Cody, Wyo.
Massey Sanderson McCullough	Engineering— Second Year	Missoula
Maud Brooks McCullough	Literary—12	Missoula
Georgia MacDonald	Classical—15	Anaconda
Mildred Alene McGregor	Literary—49½	Missoula
Donald Bernard McGregor	Engineering— Second Year	Missoula
Herman Cole McGregor	Engineering—Fourth Year	Missoula
Gilbert McLaren	Engineering— Second Year	Hamilton
Gladys Ann McLean	Literary—22½	Anaconda
Walter Herbert McLeod	Literary—48½	Missoula
Edward Miller	Engineering—First Year	Missoula
Arthur Ivason Morgan	Literary—130	Marshfield, Ore.
Ewing Montgomery	Science—15½	Anaconda
Fred Murphy	Engineering—First Year	Missoula
May Elizabeth Murphy	Literature—113½	Helena
Nora Nicholls	Literary—14	Butte
Ethel Orvis	Literary—79	Missoula
Winnifred Phillips	Classical—30	Stevensville
Daisy Penman	Classical—59½	Columbus
Julius Peterson	Classical	Helena
Edna Crete Pratt	Literary—82	Missoula
Emma Putney	Science—55	Missoula

Edna Railsback	Literary—15	Billings
Mary Frances Rankin	Literary—84	Missoula
Stephen Reardon	Engineering—First Year	Boston, Mass.
Genevieve Reid	Literary—11	Missoula
Curtis Rentfro	Science	Sigourney, Ia.
Annabelle Robertson	Classical—25½	Hamilton
Lucia Ione Rolfe	Classical—67	Monarch
Herbert Edgerton Rolfe	Literary—11½	Monarch
Isabel Ronan	Literary—70½	Missoula
Peter Ronan	Literary	Missoula
Marjorie Lee Ross	Literary—16	Missoula
Edna Pearl Rosean	Literary—43	Columbus
William Emmett Ryan	Engineering—First Year	Chouteau
Claire Salisbury	Science—52	Anaconda
Roberta Satterthwaite	Literary—33	Iron Mountain
Joseph Michael Schmit	Engineering—First Year	Helena
Clement Schoonover	Engineering—First Year	Sheridan
Sylvanus Schoonover	Engineering—First Year	Sheridan
Herbert William Silloway	Engineering—Second Year	Lewistown
Morton Simpson	Engineering—Second Year	Stevensville
Frank Harold Sloane	Engineering—First Year	Missoula
Burton Smead	Engineering—First Year	Missoula
Helen Antoinette Smead	Science—115	Missoula
Ralph Wallace Smith	Engineering—First Year	Bay City, Mich.
Ruth Lenore Smith	Classical—119½	Helena
Rhoda Smith	Literary—30	Stevensville
James Beryl Speer	Literary—114	Petoskey, Mich.
Harvey George Spencer	Science—16	White Sulphur Springs
Clarissa Spencer	Literary—114½	White Sulphur Springs
Beatrice May Stillinger	Literary—14	Iron Mountain
Mary Edith Steele	Science—25½	Billings
Fred Thayer Stoddard	Engineering—Second Year	Missoula
Knute Emil Swenson	Classical—36½	Chicago, Ill.
William James Tait	Engineering—First Year	Missoula
Florence Thieme	Classical—76½	Missoula
Frederick Thieme	Engineering—First Year	Missoula
Dillwyn Llewelyn Thomas	Engineering—First Year	Butte
Katherine Eloise Tibbets	Literary—15	Helena
Frank Toole	Engineering—First Year	Hamilton
Allan Hardenbrook Toole	Engineering—Second Year	Missoula
Edward Trainor	Engineering—First Year	Madison, Wis.
Leonard Van Holde	Engineering—First Year	Kalamazoo, Mich.
Beulah Van Engelen	Literary—10½	Missoula
William Montgomery Van Eman	Engineering—Third Year	Augusta
Frank Wallace	Engineering—Second Year	Missoula
Hazel Wallace	Literary—21	Missoula
De Witt C. Warren	Classical—12	Lake Geneva, Wis.
Dale Ward	Literary—64½	Hamilton

Edward Angus Wenger	Engineering—Fourth Year	Anaconda
Jocelyn Alfred Whitaker	Engineering—First Year	Missoula
Nellie Margaret Whitaker	Literary—54½	Missoula
Lucy Dora Whitaker	Literary—16	Missoula
Roy Newton Whitesitt	Literary—110½	Stevensville
Ethel Marion Wilkinson	Literary—7	Missoula
Lillian Williams	Literary—19½	Deer Lodge
Wilfred Joseph Winninghoff	Engineering—Second Year	Philipsburg
Catherine Woods	Literary	Butte
Alice Wright	Literary—65	Missoula
John Hatton Young	Classical—48½	Helena
James Blaine Yule	Engineering—Second Year	Monarch

IN ATTENDANCE AT THE BIOLOGICAL STATION.

Maurice Ricker	Des Moines, Iowa
Edith Ricker	Des Moines, Iowa
P. M. Silloway	Lewistown
Arthur Lehman	Lewistown
Charles H. Fowler	Lewistown
Mary Elrod	Missoula
Cecil Johnson	Missoula
Mary Miller	Miles City

SPECIAL STUDENTS

Elizabeth Wall Cralle	Boulder
Mary Conlon	Lolo
Evelyn Heimbach	Missoula
Lida Ethel Hurlbut	Missoula
Zona Shull	Missoula
Russel Whitebear	Crow Agency

THIRD PREPARATORY.

Amos Avery	Missoula
Vesta Lucinda Benedick	Plains
Ruth Berry	Missoula
Clarence Buck	Stevensville
Fred Sybrandt Buck	Stevensville
James Marcus Conlon	Lolo
Mary Cremans	Whitefish
Florence Demers	Arlee
James Flaherty	Cold Springs
Harold Hoepfner	Helmville
Robert Huckleberry	Billings
Beulah Elmazy Lockridge	Stevensville
Agatha Lynch	Plains
George McManis	Butte
Helen Frances Metcalf	Stevensville
Vean Ambrose Mosher	Missoula
Margaret Miller	Sheridan
Grace Evelyn Rankin	Missoula
Hulda Reed	Missoula
Florence Josephine Sleeman	Missoula
John Baker Taylor	Missoula
Warren Edward Thieme	Missoula

SECOND PREPARATORY.

Lulu Cobban	Missoula
Daniel Marion Conner	Darby
Charles Eggleston	Anaconda
Mattie Faulds	Stevensville
Peter Hansen	Missoula
Carrie Louise Hamilton	Missoula
Richard Leon Johnson	Missoula
Pearl Margaret Lynch	Plains
Mary Maloney	Missoula
Noel Matthew McPhail	New Chicago
Warren C. MacKay	Anaconda
John Miller	Missoula
Alice Maude Nixon	Augusta
Edna Power	Missoula
Margaret Elizabeth Riach	Whitefish
Hester Rolfe	Monarch
Hugh Satterthwaite	Iron Mountain
Percy E. Thompson	Lothrop
Mabel Tuttle	Renova
Edward Lawrence Vasseur	Missoula
Fred Webster	Missoula
Lucy Webster	Missoula
William Wright	Missoula

FIRST PREPARATORY.

Roy J. F. Allen	Missoula
Anna Louise Angst	Missoula
Fred Bedard	Frenchtown
John Brogan	Hall
Clara Conner	Darby
Jessie May Currey	Missoula
Harold Edwin Daigler	Missoula
Elliot Augustus Finkelnburg	Missoula
Milford Cain Ford	Missoula
Temple Grady	Missoula
Edmund Hamel	Frenchtown
John Bernard Hogan	Missoula
Everett Hughes	Missoula
Keith Kennett Jones	Missoula
Frank Kilburn	Missoula
Ralph Marden	Sheridan, Wyo.
Leila B. Nixon	Augusta

IRREGULAR PREPARATORY.

Joseph Bedard (Engineering)	Frenchtown
Earl Cronburg (Engineering)	Missoula
Fenwick Gilbert Dorman (Engineering)	Missoula
William Gombossy	New York City
May Williams (Drawing)	Missoula
Bessie Louise Willis	Glasgow

LIST OF STUDENTS IN MUSIC DEPARTMENT.

Otilla Abendroth	Butte
Bernice Berry	Missoula
Mary Cremans	Whitefish
Eva Coffee	Missoula

Lulu Cobban	Missoula
Effie Cordz	Missoula
Anna Deschamps	Missoula
Christina Donlon	Missoula
Mary Elrod	Missoula
Fay Foster	Missoula
Edith Graham	Missoula
Eda Harch	Lethbridge, Can.
Ruth James	Missoula
Bernice Kemp	Missoula
Marie Lebkicker	Missoula
Agatha Lynch	Plains
Pearl Lynch	Plains
Margaret McCampbell	Cody, Wyo.
Georgia McDonald	Anaconda
Florence Matthews	Missoula
Mrs. Newlon	Missoula
Ethel Orvis	Missoula
Mary Rankin	Missoula
Edna Rankin	Missoula
Gladys Roberts	Missoula
Margaret Riach	Whitefish
Edith Ross	Missoula
Clarissa Spencer	White Sulphur Springs
Zona Shull	Missoula
Beatrice Stillinger	Iron Mountain
Inez Wardle	Missoula
Lillian Williams	Deer Lodge
Maude Wilcox	Missoula

SUMMARY OF ENROLLMENT.

Post Graduate Students	7
College	183
Specials	6
Third Preparatory	22
Second Preparatory	23
First Preparatory	17
Irregular Preparatory	6
Biological Station	8
School of Music	33
Total	305
Counted Twice	14
Net Total	291

REGISTER OF THE ALUMNI, UNIVERSITY OF MONTANA

1898

Mrs. Ella Robb Glenny, B. A., ... Albia Iowa.
Miss Eloise Knowles, B. Ph., ... Missoula, Montana.
Instructor in Drawing, University of Montana.

1899

Zoe Bellew, B. A., M. A. (Mrs. Sidney Mire Ward), Hamilton, Montana.
Earl Douglas, M. S., ... Pittsburg, Pennsylvnia.
Assistant Paleontologist Carnegie Museum.
Anna Louise Hatheway, B. A., (Mrs. Wm. D. Harkins), ... Missoula, Montana.
George Hempstead Kennett, B. S., (M. D. Rush Medical College),
Physician, Wardner, Idaho.
Helen McCrackin, B. A., (M. A. University of Chicago), . .
Bookkeeper, Hamilton, Montana.
Charles Pixley, B. S., (M. D., Rush Medical College), . .
Physician, Missoula, Montana.

1900

Charles Earl Avery, B. Ph., ... Lawyer, Missoula, Montana
Gertrude Buckhouse, B. S., ... Missoula, Montana.
Librarian, University of Montana.
Caroline Harrington Cronkrite, B. S., (Mrs. C. H. Deur H. Grubbs), ... Sixth Infantry, Fort Missoula, Montana.
Lu Knowles, B. S., (Mrs. R. J. Maxey), ... Twenty-Fourth Infantry, Madison Barracks, New York.
Eben Murray, B. A., ...
Percy Shelley Rennick, B. A., (M. D., Kentucky Medical College),
Physician, Victor, Montana.
Sidney Elery Walker, B. S., (LL. B., Michigan), ... Lawyer, Fairview, Oklahoma.

1901

Estelle Bovee, B. Ph., ...
Hugh Graham, B. S., . Frazer Lumber Co., San Francisco, California.
Sue Lewis, B. A., (Mrs. W. A. Thompson), . St. Louis, Missouri.
Mary Lewis, B. A., (Mrs. W. B. Simpson), Leavenworth, Washington.
Lydia Jimmie Mills, B. S., (Mrs. C. H. Rittenour), Plains, Montana.
Bertha Simpson, B. Ph., ... Missoula, Montana.
Teacher, Public Schools.
Sidney Mire Ward, B. Ph., . . . In Mining, Hamilton, Montana.
George Cutler Westby, B. S., (M. E.), ... McGill, Nevada.
Steptoe Valley Mining and Smelting Co.
Kathryn Wilson, B. Ph., ... Seattle, Washington.
Associate Editor of "Open Door."

1902

Frederick Anderson, B. S., (M. E.), . . . Anaconda, Montana.
Anaconda Copper Mining Co.
George Barnes, B. A., Classical, (D. D. Oxford University),
Minister, Coldwater, Michigan.

Harold Blake, B. S. . . . . Washington, D. C.
Chief Clerk Spanish War Claims Commission.
William O. Craig, B. S., ... Lawyer, Helena, Montana.
Deputy Clerk, Supreme Court.
Helene Kennett, B. A., (Literature), ... Missoula, Montana.
Office of Dr. W. P. Mills.
Helena La Caff, B. A., (Classical), (Mrs. Roy Jackson), ... Calgary, Canada.
Agnes McDonald, B. A., (Classical), . . . Anaconda, Montana.
Teacher, Anaconda Public Schools.
Homer McDonald, B. S. . . . . Great Falls, Montana.
Assayer, Boston and Montana Smelter.
Grant McGregor, B. S., ... Anaconda, Montana.
Electrical Engineer, Anaconda Copper Co.
Fanny Maley, B. A., (Literary), ... Missoula, Montana.
Teacher, Public Schools.
Helen McPhail, B. A., (Classical), ... New Chicago, Montana.
Teacher, Public School.
Jeannette Rankin, B. S., ... Missoula, Montana.
Katherine Ronan, B. A., (Classical), (Mrs. Trask), ... Bingham Canyon, Idaho.
Margaret Ronan, B. A., (Classical), ... Missoula, Montana.
Teacher, Public Schools.
Pearl Scott, B. A., (Classical), ... Pocatello, Idaho
Teacher, Public Schools.
Guy Sheridan, B. S., ... Butte, Montana.
Assayer, Butte Reduction Works.
Benjamin Stewart, B. S., ... Wallace, Idaho.
Assistant Engineer, Federal Mining and Smelting Co.
Edith Watson, B. A., (Classical), (Mrs. C. H. Keel), Pawnee, Illinois.

1903

Mrs. Charles E. Avery, B. A., (Classical), . . . Missoula, Montana.
Miriam Hatheway, B. A., (Classical), Post Office, Missoula, Montana.
Mabel Jones, B. A., (Literary), . . . Teacher, Missoula, Montana.
Lillian F. Jordan, B. A., (Literary), (Mrs. T. L. Bendon), ... Tokna, Montana.
Martin Jones, B. S., ... Teacher, Philippines.
Rella Likes, B. A., (Literary) Teacher, Missoula, Montana.
Lucy Likes, B.A., (Literary), -- ---- ---- - Teacher, Missoula, Montana
Claude O. Marcyes, B. A., (Literary), ... Merchant, Forsyth, Montana.
Ida G. Rigby, B. A., (Literary), (Deceased, February 19, 1904).
Eloise Rigby, B. S., ... Teacher, Missoula, Monta
Wellington Rankin, B. S., ... Law Student at Harvard.
Harriet L. Rankin, B. A., (Classical), (Mrs. Oscar Sedman), ... Murray, Idaho.
Leslie Sheridan, B. S., (In M. E.), . . . Draftsman, McGill, Nevada.

1904

Page Bunker, A. B., (Classical), . U. S. Surveyor, Orvando, Montana.
Moncure Cockrell, A. B., (Classical), . Lawyer, Deer Lodge, Montana.
George Greenwood, A. B., (Classical), . (M. A. Dartmouth College)
Banker, Spokane, Washington.
Walter Hammer, A. B., (Literary), . Real Estate, Billings, Montana.
Alice Herr, A. B., (Literary) . . . . . Dillon, Montana.
Superintendent of Schools, Beaverhead County.
Roxy Howell, A. B., (Classical) . . . . . Butte, Montana.
Georgia Evelyn Polleys, A. B., (Literary), . Lincoln, Nebraska.

1905

Jessie Bishop, B. A., (Literary), (Mrs. E. P. Giboney), ... Great Falls, Montana.
Anna Carter, B. S., ... Graduate Student, University of Montana.
William Oren Dickinson, B. S., . . . Chemist, Electric, Montana.
Alice Gertrude Glancey, B. A., (Literary), . Columbus, Montana. Teacher, Columbus High School.
Herbert Hughes, B. S., (Ph. G., Chicago School Pharmacy), ... Student, Rush Medical College.
John Ray Haywood, B. S., (In Engineering), . . McGill, Nevada. Draftsman, Steptoe Valley Mining & Smelting Co.
Avery Faulkner May, B. A., (Classical), (Mrs. W. O. Dickinson), ... Electric, Montana.
Charles Edward Schoonover, B. A., (Classical), . Kalispell, Montana. On Forest Reserve.
Frances Sibley, B. A., (Literary), ... Decatur, Georgia. Instructor, Converse College.
Charles Edward Simons, B. A., (Classical), ... Merchant, Missoula, Montana.
Blanche May Simpson, B. A., (Literary), . Teacher, Missoula, Montana.
Ray Epperson Walters, B. A., (Literary) . . . . Graduate Student, Columbia University.
Edward Williams, B. A., (Classical), ...

1906

Fred Elliot Buck, B. S., (In M .E.), ... Flathead Reservation
Joseph Buckhouse, B. S., (In M. E.), ... Forestry, Thompson Falls, Montana.
Maud Burns, B. A., ... Teacher, Bonner, Montana.
Elmer Reed Corbin, B. S., (In M. E.), ...
Mary Evans, B. A., ...
Grace Serena Flynn, B. A., ... Teacher, Missoula, Montana.
Thomas Leo Greenough, B. S., (In M. E.), . Contractor, Hoover, Wash.
Delbert I. Grush, B. S., (In M. E.), . Draftsman, Hamilton, Montana.
Florence Maud Johnson, B. S., ... Graduate Student, University of Montana.
Maud Esther Johnson, B. A., ... Missoula, Montana.
John Davis Jones, B. A., ... Forest Service.
Roy Daniel McPhail, B. A., . . Merchant, Drummond, Montana.
Fay Abernathy Murray, B. A., ... Graduate Student, University of Washington, Seattle, Washington.
Alma Lottie Myers, B. A., ... Teacher, Missoula, Montana.
Josie May Robb, B. A., ... Teacher, Lothrop, Montana.
Ona Mansfield Sloane, B. A., ... Teacher, Missoula, Montana.
Thomas Claude Spaulding, B. S., Forest Service, Anaconda, Montana.
Margaret Summers, B. A., ... Teacher, Corvallis, Montana.
Ruth Ward, B. A., (Mrs. D. I. Grush) . . Hamilton, Montana
Debora Wagy, B. A., . . . Principal Schools, Dupuyer, Montana.

1907

Cora Averill, B. A., (Classical) . . . . Townsend, Montana Teacher, Broadwater County High School.
James Henry Bonner, B. S., (In Engineering), . Missoula, Montana. Assistant in Engineering, University of Montana.
Charles P. Cotter, B. A., (Literary), . Ranching, Townsend, Montana.

Charles S. Dimmick, B. S., (In Engineering), ...
General Electric Co., Schenectady, New York.

Frederic Eugene Dion, B. S., (In Engineering) . . . .
. . . . Merchant, Glendive, Montana.

Stella Louise Duncan, B. A., (Classical), . . Kalispell, Montana.

Florence Editha Ervey, B. A., (Classical) . Spokane, Washington

Thomas Joseph Farrell, Jr., B. A., (Literary) . . . . .
. . . . First National Bank, Missoula Montana.

Linda Ellen Featherman, B. A., (Literary), . Drummond, Montana

Mary Monica Fergus, B. A., (Literary), . . Blaine, Washington.
Teacher, Public Schools.

Susie Garlington, B. A., (Classical), . . Stevensville, Montana.
Bookkeeper, Stevensville Mercantile Co.

King Garlington, B. S., . N. P. Freight Office, Missoula, Montana.

Ralph Earl Gilliam, B. S., ...
Graduate Student, Montana School of Mines, Butte, Montana.

Lawrence E. Goodbourne, B. A., (Classical), . San Diego, California.

Laura May Mamilton, B. A., (Literary), . Whitehall, Montana.
Teacher, Public Schools.

Ralph L. Harmon, B. A., (Literary) . . . . . .
. . . . Spokane Review, Spokane, Washington.

Anna J. Hutter, B. A., (Literary), . . . Spokane, Washington.

Daisy Kellogg, B. A., (Literary), . . Stevensville, Montana.
Teacher, Stevensville Public Schools.

Jennie A. McGregor, B. A., (Classical), . . Missoula, Montana.
Teacher, Public Schools.

James Hamilton Mills, B. S., (In Engineering), ...
On Board of Fire Underwriters, Butte, Montana.

Joseph John Moore, B. S., Northern Pacific Hospital, Missoula, Montana

Frances Nuckolls, B. A., (Literary), (Mrs. E. P. Kelley), . .
. . . . Butte, Montana.

William Hovey Polleys, B. S., (In Engineering), . Billings, Montana.
Proudfit and Polleys Lumber Co.

Joseph William Streit, B. S., ... Darby, Montana
U. S. Service.

Montgomery De Smith, B. S., (In Engineering), ...
General Electric Co., Schenectady, New York.

Lillian Warren, B. A., (Classical), (Deceased, February 22, 1908).

Alice Brown Welch, B. A., (Literary) . . . . Butte, Montana

HONORARY DEGREES CONFERRED.

1901

United States Senator Thomas H. Carter, LL. D., . Helena, Montana.

1902

His Excellency, Joseph K. Toole, LL. D., ...
Governor of Montana, Helena, Montana.

1904

Judge Hiram Knowles, LL., D., ... Missoula, Montana.

MISCELLANEOUS

CONVOCATIONS

All students are required to attend the regularly weekly convocations which are held on Wednesday at 11:30 A. M. Special convocations may be held from time to time as the interests of the University demand.

SOCIETIES

Two literary societies, the Hawthorne and Clarkia, are open to students. The first-named society is composed of young men and the second of young women. Both societies are alive and a credit to the University. Students attending the University will find membership in either of these societies most helpful and pleasant. The whole body of students and the Faculty are organized in one society entitled the Associated Students of the University of Montana. This society, through committees, manages all such general interests as Athletics, Oratory, Debates, Entertainments, etc.

Branches of the Y. M. C. A. and of the Y. W. C. A. are organized, are prosperous, and give promise of effective work along educational lines.

Three musical organizations are in existence, the University Glee Club, composed of young men, the Sextette, composed of young women, and the University Orchestra. These organizations are in flourishing condition and have provided good music for University events during the year. They furnish a splendid opportunity for all students who have musical talent to cultivate it as well as to participate in the social pleasures pertaining to such organizations.

Scholarships, Prizes and Medals

ACCREDITED HIGH SCHOOL SCHOLARSHIP

Students who hold the highest rank in the graduating classes of the accredited high schools of the State each year are entitled to free scholarship in the University for four years.

BONNER SCHOLARSHIP

This is donated by Mrs. E. L. Bonner, of Missoula, Montana, in memory of her husband, Mr. E. L. Bonner. It was open for the year 1905-1906 to the competition of members of the first year class in the collegiate department. The one holding the highest rank will be entitled to all necessary expenses (about

$300 annually) for the remaining three years of his or her college course.

This scholarship is held at present by William Van Eman of Augusta, Montana.

KEITH PRIZES IN DECLAMATION

These are donated annually by Mr. John M. Keith, of Missoula, Montana.

The first prize is $20, the second $10.

The first prize has been won by the following persons:

1898—Miss Nina Tibault.
1899—Gilbert Heyfron.
1900—Laurens Lind Hechler.
1901—Elmer Woodman.
1902—Miss Lillian Warren.
1903—Miss Blanche Ingalls.
1904—Miss Fern Healy.
1905—Miss Elois Ward.
1906—Adolphus Bennett.
1907—Miss Irene Cave.

The second prize has been won by the following persons::

1899—William O. Dickinson.
1900—Washington J. McCormick.
1901—Miss Mildred Corbin.
1902—Miss Anna M. Mirriles.
1903—Miss Anna Hutter.
1904—Miss Ethel Ambrose.
1905—Hart Willis.
1906—Marshall Harnois.
1907—Miss Agatha Lynch.

BUCKLEY PRIZE IN ORATORY

This was founded by Doctor J. J. Buckley, of Missoula, Montana, in memory of his father, Mr. H. N. Buckley, and is awarded annually to any student in the University, competing under conditions subject to the control of the Faculty. The amount of the prize is twenty dollars, derived from a permanent investment made to secure its endowment.

This prize has been won by the following persons:

Miss Anna Gray, 1896; Charles Pixley, 1897; Miss Louise Hatheway, 1898; Guy E. Sheridan, 1899; Eben Hugh Murray, 1900; Miss Kathryne Wilson, 1901; George E. Barnes, 1902; Corliss P. Hargraves, 1903; Gilbert J. Heyfron, 1904; Chas. E. Simons, 1905; Miss Alma Deschamps, 1906.

ANNIE LEWIS JOYCE MEMORIAL MEDAL

This was founded by Attorney M. M. Joyce, of Missoula, Montana, in memory of his wife, and is awarded annually for the

best essay, thesis, or poem by a member of the academic senior class, competing under the following conditions:

1. There must be at least two contestants.

2. No production shall contain more than 3,000 words.

3. Each production shall be type-written, shall be signed with a fictitious name, and shall be accompanied with a sealed envelope containing the real name of the writer and bearing the fictitious name on the outside.

4. All productions must be submitted, not later than 12 o'clock noon of the first Saturday in May to the president, who will, in turn, submit them to a committee appointed by the president, consisting of members of the Faculty. This committee shall have power to accept or reject any of the productions.

5. The productions that are accepted shall be submitted to another committee appointed by the president. This committee, after selecting the best production, shall submit the sealed envelope corresponding to this production to the secretary of the Faculty, who shall, at the next regular Faculty meeting, open the envelope in the presence of the Faculty, and read the real name of the successful contestant.

6. The topic for the essay, thesis, or poem shall be announced in the catalogue, which is issued the year before the graduation of the contestants, so that they may have time during the summer for preliminary work on the topic assigned.

Topic for May, 1909: "The American Short Story."

BENNETT PRIZE ESSAY

This was founded by Mr. Philo S. Bennett, of Bridgeport, Connecticut, who set aside by will $10,000 to be distributed among twenty-five colleges or universities to be selected by Hon. W. J. Bryan, of Lincoln, Nebraska. The amount of the endowment for the University of Montana is $400, the annual proceeds of which will be given as a prize (in money or in a medal of equivalent value, at the option of the successful contestant) for the best essay by any student of the University, on some topic pertaining to good government. The conditions for the competition are the same as those governing the contestants who compete for the Annie Lewis Joyce Memorial Medal.

Topic for May, 1909: "Homestead and Exemption Laws in the Northwest."

COBBAN PRIZE IN GEOLOGY

This is given by Mr. R. M. Cobban, of Missoula, Montana, to the student showing the best knowledge of geological subjects, and is open to advanced students only. The amount of the prize is $25.

THE 1904 CLASS PRIZE

This prize is donated by the members of the class of 1904, who, in rotation, name the particular excellence for which the prize shall be given. For the year 1904-05 it was awarded to the student holding the highest rank in the first year college class in Latin, and was won by Miss Cora Averill; for the year 1905-06, to the student representing the University in the state oratorical contest, won by Miss Olive Hall; for 1906-07, to the student making the greatest progress in Chemistry, won by Dean King.

MUSIC MEDALS

Two medals are given in the Department of Music: One by Mrs. Bonner for advanced piano technique; the other by Mrs. Blanche Whitaker for effort and proficiency.

THE UNIVERSITY CERTIFICATE OF QUALIFICATION TO TEACH.

The aims of the University in providing instruction in education are as follows:

1. To fit certain University students for the higher positions in the public school service.
2. To encourage and promote the study of educational science.
3. To teach the history of education and of educational systems and doctrines.
4. To provide such courses of instruction as will secure to teaching the rights, prerogatives and advantages of a profession.

The requirements made by the Faculty for granting a University teacher's certificate are as follows:

1. GENERAL KNOWLEDGE.—Each candidate for such a teacher's certificate must hold a bachelor's or master's degree from this University.

2. PROFESSIONAL KNOWLEDGE.—He must have taken the following special courses in Philosophy and Education:

   Elementary Psychology (Psychology I and II, 5 hours); History of Education (Education IV, 3 hours); Principles of Teaching (Education VII, 2 hours); High School Pedagogy or Educational Psychology (3 hours); and three hours of work selected from the offerings of the Department of Philosophy.

3. He must, in the judgment of his instructors, not only have an adequate knowledge of the subjects studied, but possess other qualifications essential to success in teaching; it being understood that work acceptable as a part of the requirements for graduation may not justify the granting of a teacher's certificate.

4. To have his certificate engrossed with the names of special subjects of the high school curriculum the candidate must have completed normally 20 hours' work in the subject or group of closely

allied subjects, which he expects to teach, the ultimate decision as to the student's proficiency in these subjects resting with the heads of the departments concerned.

All general questions relating to the students' professional work are under the supervision of a special committee, of which the Professor of Education is chairman. All recommendations for the teacher's certificate are made to the Faculty through this committee.

All candidates for the certificate should confer with the Professor of Education not later than the beginning of their third year.

THE STATE ORATORICAL ASSOCIATION

This association was organized in 1900. The institutions represented are the Montana Wesleyan University, the Montana College of Agriculture and the Mechanical Arts, the Montana Normal College and the University of Montana. The purpose of the association is to promote the interest of work along oratorical lines.

Annual contests are held. Eight contests have been held with the following results:

1900—Won by Laurens Lind Hechler, from the University.
1901—Won by Mr. Farris, for College of Agriculture.
1902—Won by George E. Barnes, from the University.
1903—Won by Corliss P. Hargraves, from the University.
1904—Won by Gilbert J. Heyfron, for the University.
1905—Won by Mr. Williams, from Montana Wesleyan.
1906—Won by Miss Alice Mountjoy, from College of Agriculture.
1907—Won by Arbie E. Leech, from the University.

THE JOHN M. EVANS HALL

Through the liberality of Hon. J. M. Evans and other citizens of Missoula, the Literary Society Hall has been elegantly furnished. The dedication was held March 18, 1900, and was attended by a large number of students and citizens.

Mr. Evans having taken the initiative in the effort to furnish the room, it was considered proper to name the hall after the principal donor, and so it was christened the John M. Evans Hall.

THE UNIVERSITY PAPER

The Kaimin, through the effective efforts of its corps of editors, has become a permanent factor in the University life. The various difficulties, incident to the launching of a new enterprise, have been met, and the success of the University paper is assured.

The Board of Editors elected the past year was as follows:

Ruth L. Smith, '08	Editor-in-Chief
Nell Bullard, '08	Assistant Editor-in-Chief
May E. Murphy, '08	Literary Editors
Montana Buswell, '09	
Florence Thieme, '09	Organization Editor
Fred Greenwood, '09	Athletic Editor
Roberta Satterthwaite, '10	Exchange Editor
Gertrude Buckhouse	Alumni Editor
Winnifred Feighner, '08	Local Editor
Charles Eggleston, '10	Cartoonist
James B. Speer, '08	Business Manager
Vincent Craig, '08	Assistant Business Manager
Edward A. Wenger, '08	Advertising Manager
Massey S. McCullough, '10	Circulator

ATHLETIC AND GYMNASIUM WORK

A committee from the Faculty, entitled the Committee on Athletics and Gymnasium Work, has general oversight of the athletic sports and gymnasium. The details of the management are in the hands of the Board of Directors of the A. S. U. M. Regular gymnasium classes are organized for young men and for young ladies.

The Gymnasium is supplied with the necessary equipment of apparatus. The athletic field, located in the northwest corner of the Campus, is now in excellent condition. A quarter of a mile running track is nicely finished, and the entire field has been well scraped and leveled. Within this track there is located the baseball diamond and the football field. To the south are the tennis courts.

The general sports indulged in are football, baseball and basketball, together with the indoor and outdoor field sports.

The Faculty has established the following important regulations:

First. The football season will extend from September 1st to Thanksgiving Day.

Second. Only bona fide students in the University, taking at least 12 hours per week of recitations or lectures can represent the University in any of its games with other college teams. Teams representing the University will not be permitted to play teams representing other schools or colleges unless the latter conform to the same requirements for study.

Third. Before the departure of University teams to play with school and college teams elsewhere and also before games with such teams on the home grounds a list of students from which names are to be selected for University teams must be presented by managers to the Faculty for consideration and approval.

RULES GOVERNING ATHLETICS

To take effect Sept. 1st, 1907.

I. No engagement shall be made in general requiring:

(1) More than $300 expense.

(2) More than three days consecutive absence on the part of the team.

II. The following rules of eligibility, copied from the Montana State Interscholastic Association, are approved by the Faculty.

1. No person shall be allowed to compete in any athletic contest who is not an amateur. An amateur is a person who has never competed for money, or under a false name, or with a professional for a prize, or has at any time taught, pursued or assisted at athletic exercises for money or for any valuable consideration.

2. No student registering after the 15th of October shall be eligible to play in any intercollegiate contest before February 1 of that collegiate year. No student registering later than 15 days after the opening of the second semester shall take part in any intercollegiate athletic contest held during the remainder of that collegiate year.

3. No student who has been in attendance any part of a preceding semester shall be allowed to participate in any collegiate athletic contest unless he shall have completed at the opening of the semester in which he competes at least twelve credits of his last preceding semester's work.

4. Students who have played one year while in a preparatory department may be allowed to enter athletic contests for five years; otherwise the limit shall be four years.

ANNUAL INTERSCHOLASTIC MEET

The high schools of Montana are organized in a league for the promotion and control of athletics. For four years the annual meets for track contests have been held on the University grounds, occurring this year May 13, 14, 15.

Usually about twenty schools are represented with from three to twenty contestants from each school.

The University pays railroad fares of three representatives from each school, furnishes entertainment for contestants, and medals.

To the athletic contests, a contest in declamation is added, with one representative from each school.

Great interest is taken in these contests and their influence in raising standards and unifying the schools by bringing them together in friendly rivalry has been very great.

HIGH SCHOOL DEBATING LEAGUE

A Debating League having for its object improvement in debate among the students in high schools of the state was

organized by the state high school principals at a meeting held at the University, May, 1906. In the year 1906-07 thirteen of the accredited high schools took part in these debates; in 1907-08 fourteen have taken part. The final contest, to decide the state championship, is held near the close of each year, at Missoula, under the auspices of the University.

FEES

Annual Matriculation fee, payable at entrance........	$10.00
Athletic fee, per semester...........................	1.00

DEPOSITS

These deposits are required as security for the payment of breakage of apparatus. At the close of each semester the breakage of a student is deducted from his deposit and the balance returned:

Physical apparatus	$ 3.00
Chemistry I and II—Chemical apparatus, per semester............	6.00
Chemistry III—Qualitative apparatus, per semester..............	6.00
Chemistry IV—Quantitative apparatus, per semester..............	6.00
Chemistry V and VI—$10.00; each additional hour	2.00
Chemistry IX and X—Organic Chemistry, per semester............	10.00
Assaying apparatus, per semester	10.00
Biological Laboratory, per semester	3.00
Mechanical Engineering Laboratory, per semester................	5.00
Photography	5.00

EXPENSES

The Woman's Hall on the Campus is a new building, well furnished, lighted and heated. Rooms for a single occupant may be rented at $1.50 per week. If two persons occupy the same room the rate is $1.25 each. Meals are furnished at the uniform price of $4.25 per week.

Students not accommodated at the Hall are expected to find rooms and board in private families.

Good homes can thus be provided for all and at very reasonable rates. Expenses may be very materially lessened by the formation of boarding clubs. Students will not be allowed to board at places not approved by the Faculty.

EMPLOYMENT FOR STUDENTS

A large number of students of the University earn either the whole or a part of their expenses while in college. Students intending to work their way can usually do so if they come

with sufficient means to support them for the first half year, though many have made all their expenses from the beginning.

Although the University cannot guarantee work for students it is believed that those who are strong and willing to do any work that offers will be able to pay their expenses, though this may result in lengthening the student's undergraduate attendance to five years. A number of students find work about the University; as stenographers, assistants in the laboratories or in the library, as carpenters and in other capacities. Others find employment in town as clerks, reporters, janitors, newsboys, etc.

While nothing is more efficient in obtaining work than the personal endeavors of the student, a committee of the Faculty will give every aid possible. Particular attention will be paid to the needs of new students, or those who are of themselves unable to secure employment. Those wishing employment during the coming year and new students wishing information, should send their names, together with an account of the work they have done, the character of the work they wish to do, and a list of the positions they would be willing to fill, to

W. D. HARKINS,
Chairman of the Committee on Student Employment,
Missoula, Montana.

UNIVERSITY SURROUNDINGS

Missoula is located in Western Montana, on the Chicago, Milwaukee and St. Paul Railroad and on the main line of the Northern Pacific Railroad at its junction with the Bitter Root valley and Coeur d'Alene branches, thus affording easy railroad connections with all parts of the state and the northwest.

The City of Missoula is noted as being one of the most beautiful in the west, and is unexcelled as regards pure water, healthful surroundings, beautiful scenery, and all of those things that contribute to make life pleasant and agreeable.

Situated at the head of the Missoula valley and near the outlet of the Bitter Root valley, it is within the limits of the great agricultural and fruit growing regions of the state.

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